INNOVATIVE

ITEM NUMBER	5.2
SUBJECT	PUBLIC MEETING: Gateway Request: Planning Proposal - Increasing Commercial Floorspace in the Epping Town Centre
REFERENCE	F2018/03032 -
REPORT OF	Team Leader Land Use Planning

DEVELOPMENT APPLICATIONS CONSIDERED BY SYDNEY CENTRAL CITY PLANNING PANEL Nil

PURPOSE:

The purpose of this report is to seek the Local Planning Panel's advice to progress a planning proposal to mandate an increase in commercial floor space on certain land within the Epping Town Centre.

RECOMMENDATION

That the Local Planning Panel consider the following Council Officer recommendation in its advice to Council:

(a) **That** Council delegate authority to the Chief Executive Officer to prepare a planning proposal which seeks the following amendments to *Parramatta Local Environmental Plan 2011* and *Hornsby Local Environmental Plan 2013* applying to all land in the B2 Local Centre zone in the Epping Town Centre with the exception of 6 - 14 and 18A Bridge Street and 24-30 High Street relating to Option 3 detailed in this report that:
   i. Introduces a new clause which will limit the ground, first and second floors of any building facing a street to non-residential uses only and ensure a change of use proposed on these levels would not allow residential uses. An exception will be applied to that part of a building that faces a service lane or is required for entrances and lobbies, access for fire services or vehicular access associated with residential accommodation.
   ii. Amends the maximum floor space ratio (FSR) and height of buildings to accommodate additional non-residential uses.

(b) **That** the Chief Executive Officer forwards the Planning Proposal to the Department of Planning, Industry and Environment (DPIE) to request the issuing of a Gateway Determination on behalf of Council.

(c) **That** Council delegate authority to the Chief Executive Officer to prepare amendments to the relevant sections of the Parramatta Development Control Plan 2011 and Hornsby Development Control Plan 2013 to support the Planning Proposal relating to the following design controls, and place these on public exhibition with the Planning Proposal:
   i. podium height controls;
   ii. minimum floorplate dimensions;
   iii. floor to ceiling heights for non-residential uses;
   iv. location of services; and
   v. building and podium setback controls.

(d) **That** Council advises the DPIE that the Chief Executive Officer will be exercising the plan-making delegations for this Planning Proposal as authorised by Council on 26 November 2012.

(e) **Further, that** Council delegate authority to the Chief Executive Officer to correct any minor anomalies of a non-policy and administrative nature that may arise during the plan-making process.

PLANNING PROPOSAL TIMELINE

SUMMARY

1. The loss of commercial floor space within the Epping Town Centre was a key planning issue examined by Council as part of Phase 1 of the Epping Planning Review (Review) undertaken between 2017 and 2018. The Review identified that since the 2014 Epping Urban Activation Precinct rezoning, new development within the B2 Local Centre zoning (refer **Figure 1**) has reduced the amount of commercial floor space (and therefore jobs) within the Epping Town Centre. Recent developments are typically replacing large and small-scale offices with shop top housing. These developments only provide ground floor retail or business premises with residential towers above and little or no floor space for other job generating activities.

2. On 9 July 2018, Council considered the consultation outcomes and technical analysis of the Review and resolved that a planning proposal be prepared to progress new planning controls to require the provision of commercial floor space in the Epping Town Centre.

3. By mandating a minimum provision of commercial floor space in Epping Town Centre, the following land use planning objectives will be met:
   a. Supporting Epping's status as a Strategic Centre as identified in the Central City District Plan (2018) and its target of 7,000 jobs;
   b. Take advantage of Epping's accessible location and public transport availability;
   c. Providing services and products for the local and surrounding population; and

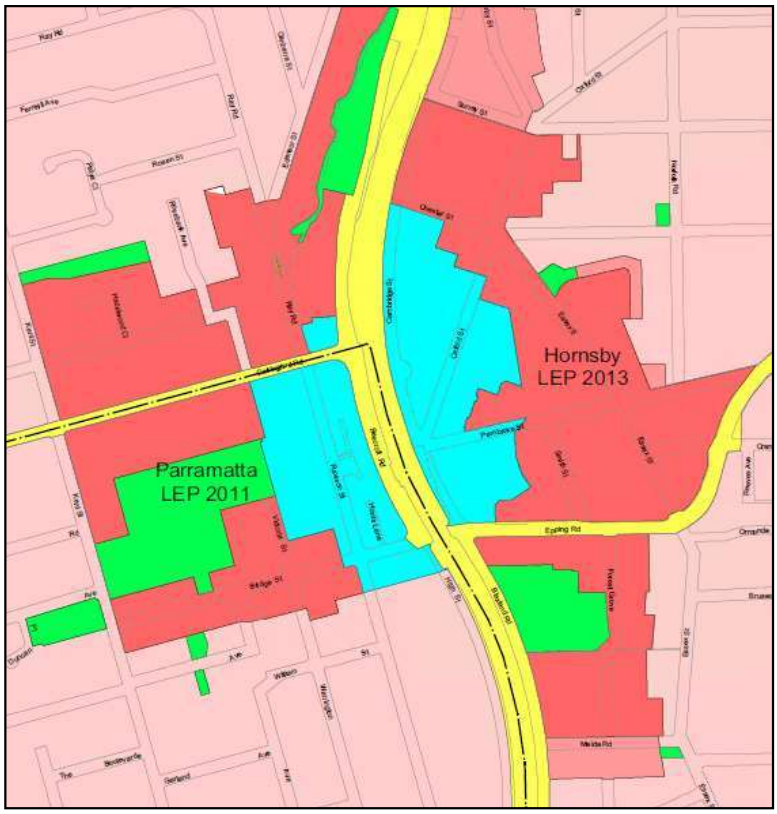
d. Supporting a vibrant and active town centre.

4. This report considers three potential planning options in relation to the provision of commercial floor space in Epping, as follows:
   - **Option 1 –** no change to planning controls, that is, based on current development trends, provision of only ground floor retail/business floor space; or
   - **Option 2** - mandate a minimum amount of non-residential floor space within the current maximum floor space ratio (FSR) and height controls; or
   - **Option 3** - mandate a minimum amount of non-residential floor space in addition to the current permitted maximum floor space ratio and height controls.
5. This report outlines the potential advantages and disadvantages of each Option. As Options 2 and 3 result in potential changes to planning controls, these would result in the need to prepare a planning proposal. Council Officer assessment concludes that Option 3, which is to mandate a minimum amount of non-residential floor space in addition to the current maximum FSR and height, is the best approach. This recommendation is based on the market's likely response to the proposed planning controls (as opposed to Option 2). Council Officers believe this is the best approach to ensure the forecast additional demand for commercial floorspace is realised in the Epping Town Centre.
6. If Option 2 was pursued, the concern is that landowners would rush to obtain approvals under the existing controls to avoid losing residential development potential and that a rush of these applications would mean that the commercial floor space targets for Epping would not be achieved.
7. It is acknowledged that there would be some adverse impact by pursing Option 3 in relation to increased overshadowing and traffic impact. However, on balance the impact is considered reasonable in order to practically deliver the additional commercial floor space required to realise Epping as a thriving and vibrant employment centre. Option 3 will result in taller buildings which will create some minor additional overshadowing. Some sites along Bridge Street will be excluded from the Planning Proposal due to the potential for overshadowing impact on adjacent residential heritage conservation areas. The exclusion of these sites will not impact substantially on the delivery of commercial floor space in the future.
8. Therefore, Council Officers recommend that Council prepares a planning proposal based on Option 3, which seeks to restrict residential uses and tourist and visitor accommodation on the ground, first and second floors of any new development, or a change of use of a building, and in order to accommodate this provide for additional height and density on certain B2 Local Centre zoned sites within the Epping Town Centre.

CURRENT PLANNING CONTROLS

9. This planning matter relates to B2 Local Centre zoned land in the Epping Town Centre. As indicated on **Figure 1** the Epping Town Centre is divided by two sets of planning controls - the *Parramatta Local Environmental Plan (LEP) 2011* and *Hornsby Local Environmental Plan (LEP) 2013.*

Figure 1: B2 Zoned Land within the Epping Town Centre shown in blue



10. Council's current Harmonisation Planning Proposal seeks to consolidate into one Planning Instrument a set of controls that will replace the controls in the five different Local Environmental Plans that currently apply in different parts of the City of Parramatta. This Planning Proposal has received Gateway Determination from the Department of Planning, Industry and Environment (DPIE) and at the time of writing this report, is currently on public exhibition. There is no change proposed to the extent of the B2 Local Centre zoning within the Epping Town Centre under the Harmonisation Planning Proposal.

11. **Table 1** summarises the planning controls, which apply to the B2 Local Centre zoning, both currently and under the Harmonisation Planning Proposal.

Table 1 Summary of Planning Controls within the B2 Local Centre zoned sites in Epping Town Centre

	Maximum FSRs	Maximum Height of Building	Permitted Land Uses/Relevant clauses
Hornsby LEP 2013	6:1 & 4.5:1	72m & 48m	- Commercial uses, shop top housing, tourist and visitor accommodation and community facilities
Parramatta LEP 2011	6.1; 4.5:1 & 3:1	72m, 48m & 21m	- Commercial uses, shop top housing, tourist and visitor accommodation and community facilities
Harmonisation Planning Proposal	As above (no change)	As above (no change)	- Permissible land uses as above. - Clause requiring B2 zoned sites to include non-residential on the ground floor.

BACKGROUND

Epping Town Centre Urban Activation Process

12. On 14 March 2014, the then Department of Planning and Environment (Department) finalised the Epping Urban Activation Precinct (UAP) amendments to the Hornsby and Parramatta Local Environmental Plans via State Environmental Planning Policy (Epping Town Centre) 2013 ("the SEPP Amendment"). The SEPP Amendment provided capacity for approximately 10,000 additional dwellings and sought to revitalise the commercial and retail core adjacent to a major transport hub.

13. The Epping UAP envisaged Epping Town Centre's future role as a residential origin, rather than an employment destination. The redevelopment of Epping was seen as providing housing growth and choice and serving nearby employment centres at Parramatta, Macquarie Park, Chatswood and Norwest. It envisaged that the majority of high-density buildings in the Epping Town Centre would provide the majority of new dwellings, with a range of retail and commercial activities at lower levels to serve the local population.

14. The rezoning resulting from the UAP process realised a net increase in sites zoned B2 Local Centre (with one site, NSW Government's Beecroft Road site being converted to R4 High Density Residential), coupled with significantly increased maximum densities and heights. The permissible land uses under the Hornsby and Parramatta LEPs remained, including commercial uses, office and shop top housing.

15. Following the rezoning, precinct specific development control plan (DCP) controls for the Epping Town Centre were introduced within the Parramatta DCP 2011 and Hornsby DCP 2013. The provisions in both DCPs encourage new development within the Epping Town Centre to allocate a proportion of the development to non-residential uses. Hornsby DCP currently requires a 2 to 3 storey podium and Parramatta DCP currently requires 'up to' 4 storeys for commercial uses. Under current planning legislation, the role of DCPs have been weakened relative to their historical role, and are considered to be a guide, which can be varied as part of the development application process.

16. Therefore, since the 2014 rezoning, new development within the B2 Local Centre zoning has resulted in the development of residential floorspace at the expense of existing office floorspace. That is, development of shop top housing, with ground floor retail or business uses and residential towers above. This issue and others relating to the consequences of the loss of commercial floorspace is discussed in more detail below.

Epping Planning Review Project – Stage 1

17. In December 2016, the Epping Planning Review (Review) was commenced by the City of Parramatta Council. The scope of the Review was to address the unintended consequences of the planning control amendments brought into effect in March 2014. It also allowed the Council to progress matters considered by the former Hornsby Shire Council, including heritage matters.

18. The Review involved the following stages:
    a. Stage 1 – the preparation of technical studies, community consultation and the release of a discussion paper for public comment.

b. Stage 2 – the statutory phase, including the preparation of planning proposals that seek to amend the current planning controls to resolve the land use issues identified during the first phase. Council is currently in this phase of the project and the Planning Proposal the subject of this report forms part of this stage.

19. Stage 1 was undertaken primarily between December 2016 and July 2018 and included the preparation of a series of technical studies, community consultation and release of the Epping Planning Review Discussion Paper and further consultation. A copy of these studies and the Discussion Paper can be found at https://www.cityofparramatta.nsw.gov.au/councilprecinct-planning/epping-planning-review.

20. Council commissioned SGS Economics and Planning to undertake a Commercial Floor Space Study to understand the loss of commercial floor space and Epping's role as a centre and therefore the future demand for retail and commercial floorspace. The Commercial Floor Space Study (the Study) is provided at **Attachment 1**.

21. Key issues identified in the Study include:
    a. Recent development activity has seen the development of new residential floor space at the expense of existing commercial floor space. The market has determined that residential is the highest yielding land use, at the expense of existing commercial floor space.
    b. The current planning controls will likely continue to result in the loss of commercial floor space and, best case, replace current ground level retail offerings.
    c. Due to some landowner's desire to maintain redevelopment potential of their land, there is currently very little commercial floor space on a long-term lease or a lease without a demolition clause. This creates an environment of uncertainty for existing and potential commercial tenants which has seen commercial uses unable to access appropriate floor space to support their business.

22. The Study identifies Epping Town Centre as having a number of competitive advantages over other nearby centres. Firstly, its high rate of growth, resulting in a larger population of residents provides a local employment pool of highly educated and professional people, as well as demand for services and jobs close by. Secondly, Epping has good accessibility, both by road and public transport. The Study highlights Epping's weaknesses, including lack of accessibility to major hospital or university precincts and the lack of prestige in relation to other centres such as Rhodes, Macquarie Park and Chatswood. The Study concludes there is demand for retail and office floor space in Epping that is not currently being met.

23. In light of the above strengths and weaknesses of Epping Town Centre, the Study modelled three employment scenarios for Epping:
    a. Low scenario - where Epping is a population serving centre and represents a further reduction in office floor space;
    b. Medium scenario - where Epping is a local centre (meeting the demands of a local catchment) and forecasts demand for 31,845sqm to 2036 of office floor space. This is in line with current provision; and
    c. High scenario, where Epping fulfils its function as a sub-district centre (as a professional services hub) and forecasts demand for 55,616sqm to 2036 of office floor space.

24. The Study concluded:
    a. The office space demand for Epping is likely to sit between the medium and high scenario and therefore supportable demand of between 40,000sqm and 45,000sqm at 2036 is considered the most likely limit for office floor space for Epping. It is noted that the Study's reference to office floor space includes knowledge intensive, population serving and health and education.
    b. The forecast demand for retail floor space in Epping to 2036 is 13,000sqm.

25. In relation to 'office' floor space, the Study anticipates that Epping is likely to function as a secondary employment centre in the local office market (supporting, not competing with, Parramatta CBD and Macquarie Park) and provide for local and small-medium enterprises and strategic knowledge intensive businesses in a highly accessible location, with smaller floorplates.
26. In relation to retail floor space, the Study identifies the opportunity to renew existing retail offerings to meet local demand (complementary to Carlingford shops), which is likely to offer quality and convenience retail and hospitality in a highly accessible location.
27. Current patterns of development are unlikely to deliver the quantum of commercial floor space required by 2036. Therefore, the Study recommends applying a non-residential floor space ratio (excluding visitor and tourist accommodation) within the B2 Local Centre zone to ensure these uses are accommodated in a truly mixed-use development providing services for the local and surrounding population.

Council Reports and Resolutions

28. On 9 July 2018, a report was considered by Council that detailed the findings of the Epping Planning Review, including the findings of the Commercial Floor Space Study and community feedback in relation to the loss of commercial floor space in Epping Town Centre. The 9 July 2018 Council report and minutes can be found at Item 18.4: https://businesspapers.parracity.nsw.gov.au/Open/2020/OC_09062020_AGN_585_AT_WEB.HTM and the resolution at: https://businesspapers.parracity.nsw.gov.au/Open/2020/OC_09062020_MIN_585.HTM#PDF2_ReportName_9025.
29. Specifically in response to the loss of commercial floor space, Council (part) resolved at its meeting of 9 July 2018:
    (l) ***That*** *a Planning Proposal including all necessary background studies and analysis be prepared to progress the recommended LEP amendments detailed in this report relating to new controls to require the provision of commercial floor space in the Town Centre and that the Planning Proposal and associated material be reported to Council for endorsement before it is forwarded to the Department of Planning and Environment seeking any Gateway Determination for the planning proposal.*
30. Further, it is noted that Council at its 9 July 2018 meeting resolved to not support any planning proposal or preliminary planning proposal which seeks to deliver additional housing to what can be achieved under the current planning controls, unless it seeks to address a planning issue identified in the Council's Epping Planning Review process related to:

a. commercial floor space in Epping Town Centre; or

b. The planning controls that should apply to the heritage conservation areas or areas that interface with the High Density Residential zones surrounding Epping Town Centre.

KEY ISSUES

Fulfilling Epping's role as a Strategic Centre

31. Epping is identified as a Strategic Centre in the Greater Sydney Commission *Central City District Plan (2018)* (District Plan), alongside Blacktown, Sydney Olympic Park, Norwest, Castle Hill, Rouse Hill, Mount Druitt and Marsden Park. The District Plan defines that all strategic centres have similar expectations, including:

- *"high levels of private sector investment*
- *flexibility, so that the private sector can choose where and when to invest*
- *co-location of a wide mix of activities, including residential*
- *high levels of amenity, walkability and being cycle-friendly*
- *areas identified for commercial uses, and where appropriate, commercial cores."*

32. In relation to employment growth, the District Plan states *that "employment growth is the principal underlying economic goal for metropolitan and strategic centres"* and as such has set a baseline jobs target of 7,000 jobs, with a higher target of 7,500 jobs by 2036.

33. In relation to balancing residential uses and the desire for employment growth, Planning Priority C10 of the District Plan *"Growing investment, business opportunities and jobs in strategic centres"* identifies that:

"Employment growth is the principal underlying economic goal for metropolitan and strategic centres. Therefore the designation of a commercial core within a strategic centre for economic and employment uses, may be necessary to manage the impact of residential developments in crowding out commercial activity.

A balance must be struck in providing adequate mixed-use or residential zoned land around the commercial core zone to ensure new residential developments can benefit from access and services in centres."

and further

"Delivering housing within a walkable distance of strategic centres is an important outcome as it encourages non-vehicle trips, which foster healthier communities. Housing within centres contributes to a sense of vibrancy; however, the delivery of housing should not constrain commercial and retail activities."

34. Council's Local Strategic Planning Statement (LSPS) came into effect in March 2020 and sets out a 20-year land use planning vision for the City of Parramatta. It aims to link the District Plan and Council's local planning framework. As such, it supports Epping in its role as a Strategic Centre and sets a jobs target of 9,400 to 2036. This jobs forecast is based on a 'high employment scenario' as per the Commercial Floor Space Study (SGS) and as identified in the Study,

this is an aspirational target. To meet this target, the following key actions are identified in the LSPS:

a. A6 - Complete a review of the B1 Neighbourhood Centre zone and B2 Local Centre zone to identify mechanisms to strengthen the economic offering in centres.

b. A2 - Undertake place-based policy or strategic analysis that informs and supports the future of specific employment precincts.

35. **Table 2** below summarises the job targets and projected demand for Epping Town Centre.

Table 2: Summary of job targets for Epping Town Centre

Strategy/ Study	Job Target / Project Demand to 2036	Notes
Central District Plan (March 2018)	7,000 – 7,500	
Epping Commercial Floor Space Study (SGS Economics 2017)	5,674- 9,353	The jobs forecast range is based on between a 'medium' to 'high' employment forecast scenario. The SGS Study notes the high scenario is aspirational and in light of the competitive offer of Epping, the supportable demand for office floor space sits between 40,000 & 45,000sqm (by 2036) and 13,000sqm of retail floor space (by 2036).
Council's Local Strategic Planning Statement (March 2020)	9,400	This jobs forecast is based on a 'high employment scenario' as per the Commercial Floor Space Study (SGS) and as identified in the Study, the high scenario is aspirational.

36. The Census employment figures for the Epping Town Centre indicate a loss of 1,827 jobs over a 5 year period, as follows:

- 2011 Census – 5,550 jobs; and
- 2016 Census – 3,723 jobs.

It is expected that this loss will continue with the types of development occurring in the Town Centre.

37. Council Officers have undertaken analysis of sites which have redevelopment potential zoned B2 Local Centre within the Epping Town Centre (excluding those sites that have already realised redevelopment potential). The analysis assumes that future development of these sites would include ground floor retail and first and second floor commercial (or other non-residential uses).

38. The analysis found that there is potential for these sites to yield approximately 57,000sqm of non-residential floor space comprising:

a. Approximately 10,750sqm of retail floor space on the ground floor; and

b. Approximately 46,250sqm of commercial or non-residential floor space on the first and second storeys.

39. The above analysis demonstrates that by providing non-residential within the first three levels of development, that the projected demand identified in the SGS Commercial Floor Space Study of between 40,000 and 45,000sqm of office floor space may be met, and the projected demand of 13,000sqm of retail floor space by 2036 could be met (noting that the existing non-residential floor space is not included in calculations).

40. It is important to note that larger sites in Epping (over 6,500sqm in site area) that were included in the projections above, could accommodate significantly more non-residential floor space through their redevelopment within the Epping Town Centre and therefore the projected overall non-residential floor space may further increase.

Options for Mandating Non-Residential Floor Space

41. In order to achieve commercial floor space targets for Epping (described above), there are three potential planning approaches, as follows:
    a. **Option 1 –** no change to planning controls, that is, based on current development trends, provision only ground floor commercial (retail); or
    b. **Option 2** - mandate a minimum amount of non-residential floor space within the current maximum floor space ratio controls; or
    c. **Option 3** - mandate a minimum amount of non-residential floor space in excess of the current maximum floor space ratio (FSR).
42. The Commercial Floor Space Study concludes that Option 1 would likely result, based on current development trends and permissibility of shop top housing within the B2 Local Centre Zone, in retail or business on the ground floor with residential towers above. Therefore, over time this would result in further commercial floor space and job loss within the Epping Town Centre.
43. Options 2 and 3 would provide for future commercial and retail floor space targets for Epping to be met, and would require changes to planning controls, that is, an amendment to the Hornsby LEP 2013 and Parramatta LEP 2011 via a Planning Proposal. Therefore, an assessment of these two options is presented in more detail in this report below.

Commercial Floor Space Traffic Study

44. In order to understand and compare the traffic impact of the planning options for increasing commercial floor space in the Epping Town Centre, Council commissioned EMM Consulting to undertake a traffic study. The Commercial Floor Space Traffic Study (February 2020) is provided at **Attachment 2**.
45. By way of background, Council originally commissioned EMM Consulting to prepare a model for Epping which resulted in the preparation of the Epping Town Centre Traffic Study (May 2017) - the town centre wide traffic study which informed the Epping Planning Review.
46. The Commercial Floor Space Traffic Study (the Traffic Study) modelled three planning scenarios at the year 2026:
    a) Scenario 0 – Baseline - a forecast development scenario of the existing pattern of development.
    b) Scenario 1 - a minimum 3 storeys be provided of non-residential uses within the existing FSR (i.e. Option 2).
    c) Scenario 2 – a minimum of 3 storeys be provided of non-residential uses in addition to the existing FSR (i.e. Option 3).
47. The Study quantified the expected impact on traffic for each Scenario, that is, impact at peak hours (morning (AM) and afternoon (PM)) at key intersections in Epping Town Centre.
48. Overall results indicate that in comparison to the base year (2026) traffic conditions, both Scenarios are showing some increased traffic volumes. Noting

that commercial uses generate more car traffic than residential uses in both the AM and PM peak periods. In summary:

a. In the morning peak there is overall worsening in intersection delays as compared to Baseline 2026, however Scenario 1 has less overall delays in additional seconds than Scenario 2.

b. In the afternoon peak traffic conditions generally perform better than the morning peak, which is primarily believed to due be the Epping Bridge widening (therefore relieving westbound traffic flows).

49. Each of the key impacts under the morning and afternoon peaks are described below. Note that the term 'level of service' refers to how well the road intersection is operating from a commuter's perspective. Typically, six levels of service are defined and each is assigned a letter designation from A to F, with level of service 'A' representing the best operating conditions, and level of service 'F' the worst.

Traffic Impact at the Morning Peak

50. The key results in relation to the morning peak are summarised in **Table 3** below. It is noted that four key intersections will be already operating under the Baseline Scenario (at 2026) at highly congested traffic conditions (level of service F) – these are Carlingford Road/Midson Road; Carlingford Road/Ray Road/Rawson Street; Carlingford Road/Beecroft Road; and Epping Road/Essex Street. Both Scenarios 1 and 2 will further increase the delays to three of these intersections during the morning peak. In addition, two intersections will experience changes to the level of service under both Scenarios.

Table 3. Summary of Impact on Key Intersection at Morning Peak for each Scenarios

Intersection	Summary of Impact of Scenarios 1 & 2 against Base Case
Carlingford Rd/Ray Road/Rawson Street	Will continue to operate at level of service F - with increase in intersection delays less under Scenario 1 (59.3 sec) than Scenario 2 (134.2 sec).
Carlingford Road/Beecroft Road	Will continue to operate at level of service F - with increase in intersection delays slightly greater under Scenario 1 (17.8 sec) than Scenario 2 (17.4 sec).
Epping Road/Blaxland Road/Langston Place	Will change from a level of service C (baseline) to level of service D (both Scenarios).
Epping Road/Pembroke Street	Will change to a level of service A (baseline) to level of service B. Both level of service A and B are acceptable levels of service.
Epping Road/Essex Street	Will continue to operate at level of service F - with increase in intersection delays under both Scenarios 1 and 2. The increase in delay time is less in Scenario 1 (17.7 sec) than under Scenario 2 (19.7 sec).
Carlingford Rd/Midson Road	Will continue to operate at level of service F – with increase in intersection delays slightly greater under Scenario 1 (17.8 sec) than under Scenario 2 (17.4 sec).

Traffic Impact at the Afternoon Peak

51. In the afternoon, peak traffic conditions generally perform better than the morning peak, which is primarily believed to be due to the Epping Bridge widening relieving westbound traffic flows.

52. There are no changes to service levels for any of the key intersections under Scenarios 1 or 2 (as compared to Baseline 2026). However, the Carlingford Road/Beecroft Road intersection, which will be operating at over capacity traffic conditions (level of service F), will experience increases in the level of delay (37 and 49.5 seconds respectively) under Scenarios 1 and 2.

Conclusion

53. It is acknowledged that there are, and will be, highly congested traffic conditions in Epping under the current planning controls, and that the proposal to mandate additional non-residential floor space will result in additional delays at identified intersections in the peak (in the short to medium term). Notwithstanding this, it is recommended the mandating of non-residential floor space within Epping Town Centre be pursued.

54. As a result of changes to planning controls, there will be a short to medium term adverse traffic impact, however this must be balanced with the long term pursuit of the strategic goal of making Epping a thriving Town Centre. There are demonstrable benefits from having an activity and employment based centre which is best placed to serve the needs of the broader community.

55. Furthermore, Council will continue to focus its efforts on delivering and advocating for the necessary traffic and transport improvements required in Epping. By taking advantage of Epping as a public transport hub this will continue to assist in resolving the road based transport issues, and seeking improvements in public transport provisions in areas east and west of Epping to reduce the levels of private vehicle through traffic, which is currently the primary source of congestion problems in the Epping Town Centre.

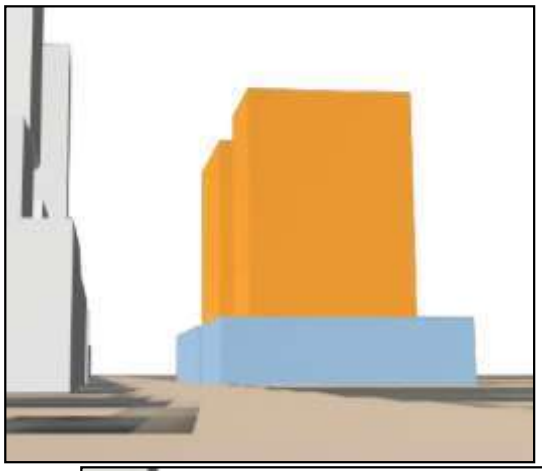
56. Whilst this approach would result in additional short term congestion, in the longer term it would help establish Epping as a thriving centre with a sustainable mix of use, and rely on future transport improvements that encourage use of other forms of transport to resolve the road based transport issues.

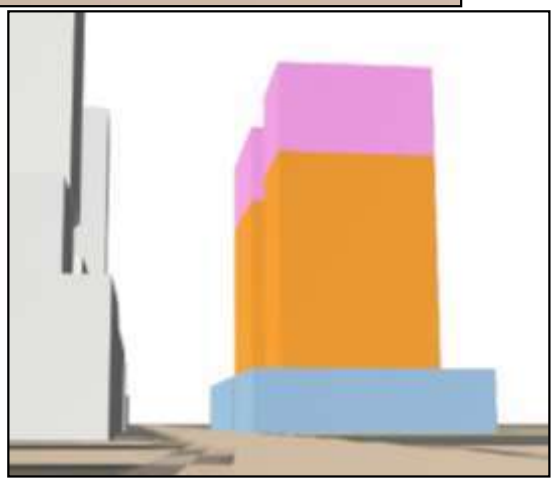
Overshadowing Analysis

57. If Option 3 was pursued as a Planning Proposal, it would result in an increase in density and height controls on B2 zoned sites within the Epping Town Centre. An example of a potential change to the built form is shown in **Figures 2** and **3** below, where blue is shown as the minimum amount of non-residential floor space proposed to be mandated under Option 2 and 3, with the orange floor space (likely residential) as compliant under the current height and density controls. The pink area highlighted in **Figure 3** is the additional floor space required under Option 3.

Figure 2: Example of potential built form outcome under Option 2 (current FSR and height controls under the LEP)

Figure 3: Example of potential built form outcome under Option 3 (an increase in FSR and height controls)





58. Under Option 2 and 3, as compared with Option 1 (status quo) the street level would likely be improved as the development control plan (DCP) controls for the Epping Town Centre would be realised, that is, a 3 to 4 storey podium for commercial uses, with a residential tower above. Current development typically has one storey of commercial floor space and a residential tower above. A better street wall podium, with well set back residential towers would create an appropriate human scale built form.

59. An impact of additional density and height (and therefore taller buildings) is an increase in overshadowing. In order to compare the extent of overshadowing of Option 2 (current planning controls) and Option 3 (additional height and density to the current planning controls), Council's City Design Unit created a 3D model for all B2 Local Centre zoned sites in Epping Town Centre, inputting the following data:

    a. Development that is constructed or under construction and applying current planning controls for Option 2 only, as it is assumed these developments are finalised;

    b. Development applications that have been approved or currently under assessment (however construction not commenced) and applying both current planning controls for Option 2 and proposed planning controls under Option 3; and

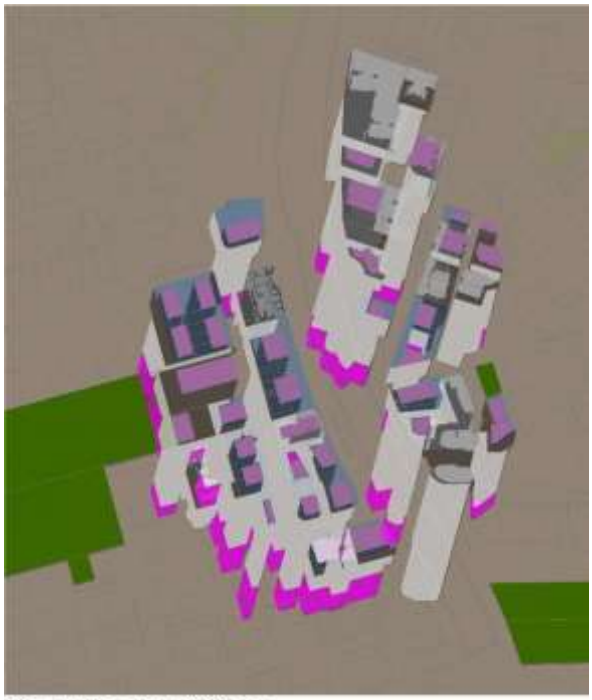
    c. Sites which have not lodged development applications and not realised the full potential of the planning controls and applying both current planning controls for Option 2 and proposed planning controls under Option 3.

60. The 3D model then calculated the difference in overshadowing impact for the sites modelled under Options 2 and 3. The shadows cast were analysed on an

hourly basis between 10am and 2pm on 21 June (winter solstice), as this is the time of the year that the sun is lowest in the sky and the shadows cast are the longest. The hourly shadow analysis between 10am and 2pm at 21 June is provided at **Attachment 3**.

61. **Figures 4 and 5** below provides a snapshot from the shadow analysis at 11am and at 1pm on 21 June. The pink shaded area indicates the potential net increase in overshadowing caused by increasing the height and density to accommodate an increase in commercial floor space. It is noted that the grey areas include both the shadow under the existing planning controls (Option 2) and shadow from Option 3 (therefore no resultant net increase of shadow).

Figures 4 and 5: Net shadowing increase (shown in pink) between Option 2 and Option 3 on B2 Local Centre zoned sites in Epping Town Centre on 21 June at 11am and at 1pm.



21 June 11:00am

21 June 1:00pm

62. The overshadowing analysis at **Attachment 3** shows that any additional overshadowing (shown in pink) falling on the edge of Boronia Park, the residential areas to the south west of the Epping Town Centre and over the railway line between 10am and 11am, is marginal and has progressed further eastward by 12 midday. Therefore the overall net additional overshadowing caused by Option 3 for the majority of B2 sites is considered acceptable.

63. However it is noted that the additional net shadow (shown in pink) caused by additional height and density at 6, 8, 10, 12, 14 and 18A Bridge Street and 24-30 High Street largely impacts those sites to its immediate south for the majority of time between 10am and 2pm (refer **Attachment 3** and **Figure 6**). **Figure 6** below highlights the overshadowing impact at 12pm as a result from an increase in density and height from these sites. The sites impacted are located along Rawson and High Streets, are low density residential areas and sit within the Epping Eastwood Heritage Conservation Area under the Parramatta LEP 2011. It is therefore recommended that the B2 Local Centre sites 6, 8, 10, 12, 14 and 18A Bridge Street and 24-30 High Street be excluded from any planning proposal for Option 3.

64. The exclusion of these sites would not impact substantially on the delivery of commercial floor space in the future, as the sites have a current maximum FSR of 3:1 and height of buildings of 21 metres, the lowest density and height controls in the Epping Town Centre.

Figure 6: Additional overshadowing at 12 midday (shown in pink) onto the Epping Eastwood Heritage Conservation Area and residential area (shown in orange) by sites along Bridge and High St (shown in black dash line)

65. The likely amendments to FSR and height controls that apply to the B2 Local Centre zone under the Parramatta LEP 2011 and Hornsby LEP 2013 required to accommodate additional commercial floor space are explained under Option 3 below.

Market Response

66. Another key issue to consider when examining how to achieve an increase in commercial floor space in Epping Town Centre is how the market - developers and/or landowners - will respond to Options 2 and 3.

67. A key risk for the implementation of Option 2 (to mandate a minimum amount of commercial floor space within the current height and FSR controls), is that the market will attempt to avoid the amendment to the planning controls. Based on development trends since the 2014 rezoning of Epping Town Centre, the market has determined for Epping that residential is the highest yielding land use, that is, residential floor space gains higher financial returns than commercial floor space. Option 2 will result in displacing current allowable residential floor space for commercial floor space within shop top housing development.

The timeframe for a planning proposal to be finalised, that is, the legal amendment to the local environment plan (LEP), is between 12 and 18 months. In the time it takes to process the planning proposal for Option 2, it is anticipated that landowners / developers will lodge development applications for shop top housing developments to ensure that they realise the land's development potential. A standard length of a development approval is for 5 years. Therefore the key achievement of increasing commercial floor space may be lost within the timeframe for processing the planning proposal and the length of time a development approval stands.

68. Alternatively Option 3, would result in an increase in commercial floor space whilst maintaining the residential development potential on any site. It is anticipated that the market would respond positively to Option 3 and the delivery of an increase in commercial floors pace in Epping Town Centre.

PLANNING PROPOSAL – OPTION 2 OR 3

69. Three potential planning approaches have been identified in relation to the provision of commercial floor space in Epping. As Option 1 will likely continue to result in the loss of commercial floor space and does not address Epping as a Strategic Centre it is recommended that this option is not pursued.

70. As Options 2 and 3 would require potential changes to planning controls, they each would result in the need to prepare a planning proposal to amend the Hornsby LEP 2013 and Parramatta LEP 2011. Council Officers recommend pursuing Option 3 as a planning proposal. An assessment of the relative merits Options 2 and 3 is summarised below.

Option 2 - mandate a minimum amount of non-residential floor space within the current maximum floor space ratio and height controls.

71. As detailed in the assessment section of this report, Option 2 results in some short to medium term traffic impact, however Council will continue to build, plan for and advocate for improvements to the road network in Epping and to take advantage of the public transport centre it has become.

72. Although on paper Option 2 would deliver an increase in non-residential floor space, practically it is unlikely the market would respond favourably to the proposed controls. Council may experience a rush of development applications lodged for sites in Epping by landowners and developers in order to avoid the proposed controls. This would result in a lost opportunity to deliver commercial floor space within Epping Town Centre, in most cases a permanent loss due to the strata of residential units, which would be unlikely to be redeveloped again within 50 to 80 years.

Option 3 - mandate a minimum amount of non-residential floor space in excess of the current maximum floor space ratio (FSR).

73. Option 3 involves increasing the commercial floor space requirements by amending the height and density (FSR) controls to retain, where it results in minimal impact, an FSR for residential equivalent to existing levels. This would mean increases in overall density and building heights but makes delivery of more commercial floor space more viable.

74. Landowners or developers may support Option 3 as it would not decrease the residential potential available on a site, which is currently viewed by the market as the highest yielding land use. However it is acknowledged that concerns in relation to any increase in building height and density of development in and around Epping are issues local residents and other stakeholders raised during the Epping Planning Review.

75. Traffic impact in the morning peak, in the short to medium term, would be greater than Option 2 (refer to paragraphs 50-56 above), however as stated above, this must be balanced with the long term pursuit of creating a vibrant employment based Town Centre. It is also recognised that further traffic and

transport improvements need to be advocated for and undertaken by Council to ease congestion.

76. If a planning proposal was pursued, the following **Table 4** indicates the proposed FSR and heights that would be required to accommodate the additional commercial floor space provision.

Table 4: Proposed FSR and Height of buildings under Option 3

Current Maximum FSR and Height of Building (HoB) Controls on B2 sites in Epping	Proposed Maximum FSR and Height of Building (HoB) Controls on B2 sites in Epping
6:1 and 72 metres (22 storeys)	7:1 FSR and 90m (28 storeys)
4.5:1 and 72 metres (22 storeys)	5:1 FSR and 80m (24 storeys)
4.5:1 and 48 metres (15 storeys)	5:1 FSR and 80m (24 storeys)
3.5:1 and 21 metres (6 storeys)	No change proposed. As detailed above the sites are at 6, 8, 10, 12, 14 and 18A Bridge Street and 24-30 High Street and have shadow impact on adjacent residential heritage areas.

77. The proposed maximum FSR and heights have been devised based on the following:

    a. Urban design testing of a selection of sites with the B2 Local Centre zoning;

    b. Development applications that have been approved under the current controls and the height variations approved; and

    c. Comparative centres and their density and height controls within the City of Parramatta LGA.

78. Urban design testing was carried out on a number of sites in the Epping Town Centre, modelling development of a 3 storey commercial podium and residential tower (refer **Figure 3**). The additional height and FSR was calculated by adding the equivalent floor space of two level of commercial floor space as additional floor space above in the residential tower (noting that ground floor commercial is not counted as additional as it is already required to be provided as part of shop top housing). As floorplates of residential towers are smaller than commercial floorplates, this additional floor space resulted between 2 and 5 additional storeys of residential floors. The testing considered the requirements of building separation and solar access to units of the NSW Apartment Design Guide. It also accommodated a range of constraints such as small, irregular or isolated sites (those which cannot amalgamate with adjoining sites).

79. The urban design testing highlights the need for additional height to accommodate the additional commercial floor space (between 2 to 5 storeys depending on the size and shape of the site). However as demonstrated below, additional height is also required to rectify the historical ‘mismatch’ between the current height and density (FSR) controls for B2 Local Centre zoned sites in Epping Town Centre. This is explained in more detail in paragraphs 80 to 81 and Table 5 below and is the reason for the significant increase in height of

some sites that currently have a height of 48m. The areas where the increase in height goes from 48m to 80m is shown in **Figure 7**.

Figure 7: Proposed Building Height and FSR changes in Epping Town Centre

80. A sample of approved development approvals for shop top housing within the B2 Local Centre zone in Epping Town Centre was reviewed (refer **Table 5**). It was revealed that in the majority of cases that Clause 4.6 variations to height of buildings was used. Clause 4.6 of Hornsby LEP 2013 or Parramatta LEP 2011 allows for variation to certain development standards, including the maximum height of buildings through the development application process, subject to detailed justification. These variations to building heights were granted consent in order to accommodate the maximum FSR on these sites. This demonstrates that in most cases, a 'mismatch' between the current maximum FSR and height.

Table 5: A sample of recent development approvals and Clause 4.6 height variations

Development Approval (Address & DA ref)	Current height & FSR controls	Approved height & FSR
12-22 Langston Place (DA/468/2016)	72 metres & 6:1	3 towers (62.4m,77.3m & 92.9m) & 6:1
24-36 Langston Place (DA/237/2017)	72 metres & 6:1	87.8m & 6:1
37-41 Oxford St (DA/314/2017)	72 metres & 4.5:1	95.67m & 4.5:1
16-18 Cambridge St (DA/560/2018)	72 metres & 4.5:1	73.8m & 4.5:1
44-48 Oxford St (DA/485/2016)	48 metres & 4.5:1	Two towers (57.5m & 49.9m) & 4.5:1

81. Furthermore, proposed height and density controls of comparable centres in the City of Parramatta LGA, which allow tower developments, assist in informing the proposed controls for B2 sites in the Epping Town Centre. The Council endorsed Parramatta CBD Planning Proposal, proposes sites of 6:1 (under base FSR controls) have a general corresponding maximum height of buildings of 80 metres (under base height controls).

82. The resultant planning controls based on the site testing, development application analysis and comparable planning controls is outlined in **Table 4** above. The resultant built form will be tall slender residential tower above a 12 metre (3 storey) commercial podium.

Recommendation - Option 3

83. Council Officers recommend that Council proceed with Option 3, to mandate a minimum amount of commercial floor space in addition to the existing height and density controls. Specifically, it is recommended to prepare a planning proposal which applies to the B2 Local Centre zoning of the Parramatta LEP 2011 and Hornsby LEP 2013 within the Epping Town Centre to:

    a. Introduces a new clause which mandates non-residential uses (and therefore restricts residential accommodation and tourist visitor accommodation and car parking) to the ground, first and second floors of any building facing a street and ensure a change of use proposed on these levels would not allow residential uses. An exception will be applied to that part of a building that faces a service lane or is required for entrances and lobbies, access for fire services or vehicular access associated with residential accommodation.

    b. Amends the maximum floor space ratio (FSR) and height of buildings to accommodate additional non-residential uses.

84. Regardless of which option is pursued, it is recommended for reasons of expedience that the Chief Executive Officer (CEO) be granted delegation to prepare and forward the Planning Proposal to the Department of Planning, Industry and Environment (DPIE) to request the issuing of a Gateway Determination on behalf of Council.

DEVELOPMENT CONTROL PLAN

85. If Option 2 or 3 were pursued as a planning proposal, supporting controls would be drafted as an amendment to the Epping Town Centre controls contained in the Hornsby DCP 2013 and Parramatta DCP 2011. Potential draft DCP controls would relate to the following:

    a. setting podium height controls to ensure appropriate height of podium at street level;

    b. minimum floorplates dimensions for non-residential uses to ensure that floorplates are flexible for both office, and other non-residential uses to be located;

    c. floor to ceiling heights for non-residential uses (which are higher than residential floor to ceiling heights);

    d. location of services (to prevent the first three floors filling up with 'services'); and

    e. new building and podium setback controls.

86. It is recommended that Council delegate authority to the CEO to prepare amendments to the relevant sections of the Parramatta Development Control Plan (DCP) 2011 and Hornsby Development Control Plan (DCP) 2013 to support the planning proposal relating to design controls and place on public exhibition with the Planning Proposal.

PLAN-MAKING DELEGATION

87. Delegations were announced by the Minister for Planning in October 2012, allowing councils to make LEPs of local significance. On 26 November 2012 Council resolved to accept the delegation for plan making functions. Council also resolved that these functions be delegated to the CEO.

88. Should Council resolve to proceed with this planning proposal, Council should exercise its plan-making delegations. This means that after the planning proposal has been to Gateway, undergone public exhibition and been adopted by Council, Council officers will deal directly with the Parliamentary Counsel Office in the drafting of the LEP amendment, which is then signed by the CEO before being notified on the NSW Legislation website.

89. It is therefore recommended that Council request the DPIE that Council be granted plan-marking delegation for this Planning Proposal

CONSULTATION & TIMING

90. The matter will be reported to Council with the Local Planning Panel's advice. If Council resolves to proceed with a Planning Proposal for Options 2 or 3, Council Officers will prepare a planning proposal document under the CEO delegation and it will be forwarded to the DPIE for a Gateway Determination.

91. If the matter proceeds to public consultation, a report on the outcomes of the public exhibition will be provided to the Panel addressing any objections received. If no objections are received, the matter will be reported directly to Council seeking approval to finalise the Planning Proposal.

FINANCIAL IMPLICATIONS FOR COUNCIL

92. Under Council's Planning Agreement Policy (adopted 26 November 2018) Council may, at its discretion, enter into a planning agreement for a Planning

Proposal. The landowner would be required to provide infrastructure contributions that are valued at least 50 per cent of the land value uplift under Council's policy.

93. In relation to Option 2, the proposed amendments to the planning controls does not result in any additional density or land uplift, therefore the Policy is not applicable. Furthermore, any future development (residential or non-residential uses) would need to pay development contributions to fund local infrastructure in accordance with the relevant development contributions plan.

94. In relation to Option 3, the proposed amendments to the planning controls would result in additional density and land uplift from commercial land uses. Council Officers recommend that no planning agreement be applied to these sites for the following reasons:

    a. Based on the historic pattern of development to date, the market has been reluctant to deliver additional commercial floor space, therefore any additional monetary payment requirement may further dissuade commercial floor space provision;

    b. This is line with Council's policy position contained in the Parramatta CBD Planning Proposal which is to prioritise employment-generating floor space and to not subject this floor space to community infrastructure provisions;

    a. No planning agreements were in place at the time of the 2014 Epping rezoning for those B2 Local Centre zoned sites already developed;

    b. It is not practical to require a VPA with every individual landowner in Epping to achieve a contribution and it is unlikely in the view of Council Officers that the DPIE would support a community infrastructure mechanism such as the one proposed in the Parramatta CBD Planning Proposal for a lower order centre such as Epping; and

    c. Development contributions will apply at the time of development.

95. The preparation of the Planning Proposal and development control plan amendments and any subsequent public exhibition material would be prepared by Council Officers and therefore within the existing City Planning budget.

Bianca Lewis
Team Leader Land Use Planning

Robert Cologna
Land Use Planning Manager

David Birds
Group Manager, City Planning

Jennifer Concato
Executive Director City Planning and Design

ATTACHMENTS:

1⇩ Epping Town Centre Commercial Floorspace Study 78 Pages

2⇩	Commercial Floorspace in Epping - Traffic Study	64 Pages
3⇩	Shadow Analysis Epping Town Centre 21 June	1 Page

REFERENCE MATERIAL

Epping town centre Commercial Floorspace Study

Final report

City of Parramatta Council

June 2017

SGS Economics & Planning

Independent insight.

SGS Economics and Planning Pty Ltd
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Offices in Canberra, Hobart, Melbourne and Sydney

170091-Final report-170607

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

EXECUTIVE SUMMARY

SGS Economics and Planning has been commissioned by City of Parramatta Council to prepare a commercial floorspace study for the Epping town centre. This project forms part of the Epping Planning Review. The objective of this project is to identify the level of commercial (retail, office and business) floorspace required to meet current and future demand.

Method

This study has involved an extensive review of existing state and local planning documents to understand the current planning environment. The impact of these planning controls, including recent changes introduced through the Epping Priority precinct planning process have been examined through a review of recent development applications, planning proposals and preliminary planning proposals.

This report includes an examination of the demographic and economic profile of the Epping town centre as well as an analysis of current market trends impacting on the office and retail uses in the Epping town centre. This analysis includes a review of local trends and macroeconomic trends shaping these uses now and into the future.

Consultation has also been conducted to supplement this analysis. Consultation has been conducted with the following groups:

- City of Parramatta Council
- Epping Chamber of Commerce
- Local real estate agents
- Landowners in the Epping town centre (i.e. land zoned B2 Local Centre)

Community members have also been consulted through a community workshop to identify their current and desired uses of the Epping town centre.

Demand for retail and office floorspace has been forecast in light of these findings. Retail demand has been forecast considered the surrounding local retail market and current local expenditure profiles. Three scenarios have been forecast for office floorspace demand considering different roles for the Epping town centre.

Key findings

The Epping town centre is currently considered as a local centre in State planning documents, with recent planning through the Priority Precinct process highlighting future residential uses.
State planning documents identify Epping as a local centre, supporting the daily needs of the surrounding population. The Epping town centre is identified in the *Draft West Central Plan* as a local centre with the potential to operate as a commercial and retail node, subject to 'the right planning and investment'. The recent Priority Precinct process however has prioritised residential development in the Epping town centre, indicating that demand for office floorspace is likely to be redirected to other nearby employment centres, which may limit this potential node from being realised.

Prior to the Priority Precinct process, the Epping town centre contained a relatively even mix of industries, providing local retail and services as well as employment opportunities across a range of industries.
At the 2011 Census, there were 4,512 jobs in the Epping town centre accommodated in approximately 55,000 square metres of office floorspace and 12,900 square metres of retail floorspace. Recorded

employment was evenly split across the Grater Sydney Commission's four industry classes; knowledge intensive, population serving, industrial, and health and education. This split of jobs indicates that Epping is an accessible location, and has attracted jobs in industries that do not rely on local populations, such as knowledge intensive jobs in professional services.

Recent development activity has seen the development of new residential floorspace at the expense of existing office floorspace that has been supporting this local employment. The quantum of retail floorspace remains the same as existing sites are redeveloped.
Since new planning controls were introduced in 2014, a significant amount of development activity has been recorded in the Epping town centre and the wider Priority Precinct. The majority of development in the Epping town centre is for 'mixed use' development, with commercial floorspace to support retail and office uses on the ground floor and residential floorspace on the remaining floors. This is in spite of existing local design controls encouraging the first 2 to 3 storeys of new development in the town centre to be allocated to non-residential uses.

Epping continues to experience demand for retail and office floorspace, however development activity has seen commercial uses unable to access appropriate floorspace to support their business.
The Epping town centre remains a desirable location for businesses to locate. The high quality public transport infrastructure and connections across Greater Sydney continue to attract new and existing retail and office uses to the Epping town centre. However, there is currently very little commercial floorspace on a long term lease and/or a lease without demolition clauses and land owners aim to retain the potential to redevelop their site. This impacts on the operation and certainty of businesses and has seen high demand for existing floorspace.

In light of this demand, forecast population growth, the size and infrastructure investment in the centre, Epping is considered to function as a sub-District centre, playing a more significant role than other nearby local centres.
Given Epping's close proximity to other strategic centres at the metropolitan level and the factors identified above, the role of Epping now and into the future is considered to be a sub-district centre, which meets the needs of a local residential population as well as providing higher-order services and commercial space for small to medium sized businesses. This would place Epping between local and District centres in the Greater Sydney Commission's hierarchy.

In light of this sub-District centre function, over the next 20 years there is forecast demand for 13,000 square metres of retail floorspace and 55,616 square metres of office floorspace in the Epping town centre.
These numbers represent the total demand for floorspace to 2036. This quantum of commercial floorspace is forecast to support the functioning of the Epping town centre to meet the needs of surrounding residents and to provide diverse employment opportunities in small to medium enterprises in a highly accessible location in Greater Sydney.

Current patterns of development are unlikely to deliver the quantum of floorspace required by 2036. A non-residential floorspace ratio is recommended as a means to deliver commercial floorspace.
A minimum non-residential floorspace ratio requiring a proportion of floorspace in new developments for commercial uses is recommended across the Epping town centre to ensure these uses are accommodated in truly mixed use developments providing services for the local and surrounding population, and enabling Epping to fulfil its role as a sub-District centre.

1 INTRODUCTION

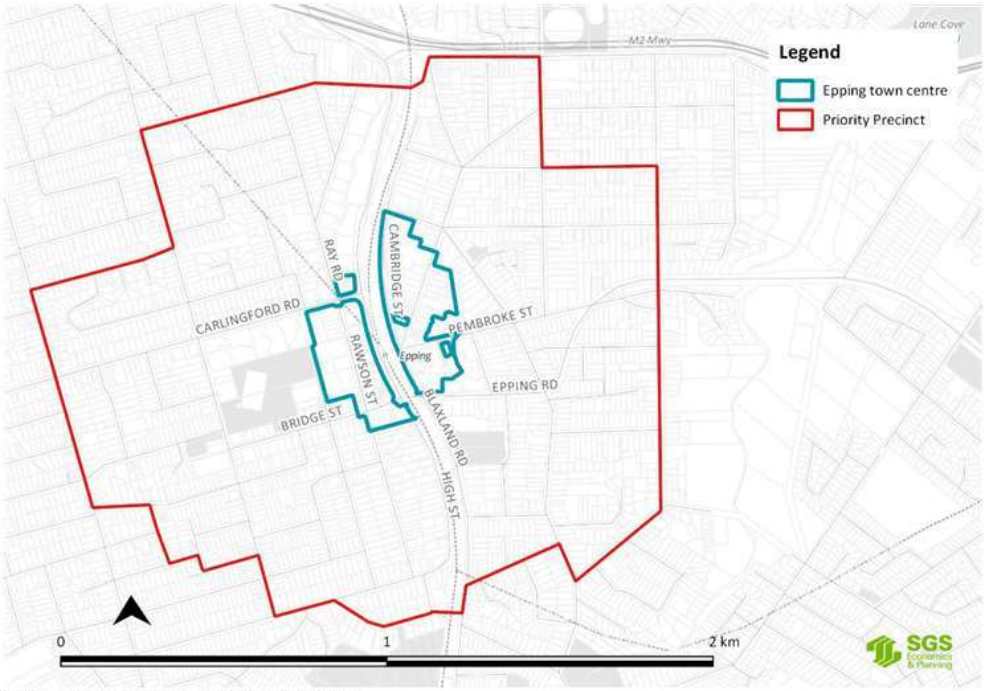
SGS Economics and Planning has been commissioned by City of Parramatta Council to prepare a commercial floorspace study for the Epping town centre. The objective of this project is to identify the level of commercial (retail, office and business) floorspace required to meet current and future demand and any changes that should be made to planning documents to meet this demand.

This project forms part of the Epping Planning Review. The Epping Planning Review follows the incorporation of the whole of the Epping town centre into the City of Parramatta local government area in 2015 (the eastern side was previously in the Hornsby LGA). The Epping Planning Review intends to deliver one set of planning controls for Epping with an integrated infrastructure plan taking into account the needs of residents, workers and visitors.

1.1 Study area

Figure 1 shows the study area/s for this report. For the purposes of this report, the Epping town centre is defined as the land zoned B2 Local Centre around the train station. The wider Epping centre incorporates land within 800 metres of the train station that was included in the Epping Priority Precinct (formerly Urban Activation Precinct). The terms Epping town centre and Epping Priority Precinct are used throughout this report to refer to the areas shown in blue and red outline respectively in Figure 1.

FIGURE 1. EPPING TOWN CENTRE AND PRIORITY PRECINCT



Source: SGS Economics and Planning, 2017

1.2 Scope of work

This report analyses demand for commercial floorspace. Commercial floorspace refers to the sum of retail, office and other non-residential floorspace in the Epping town centre. Demand for social infrastructure, however, is assessed in a separate report.

This report considers the following:

- Review of the local and state planning context for the Epping town centre and wider area
- Analysis of Epping's existing economic profile
- Review of market drivers for office, retail and other commercial floorspace
- Assessment of local market conditions and recent trends impacting on non-residential floorspace in the Epping town centre
- Assessment of demand for retail, office and other commercial floorspace in the Epping town centre to 2036
- Articulate the role and function of the Epping town centre in light of these factors and identify planning mechanisms required to achieve this vision.

1.3 Structure of the report

The remaining chapters of this report are as follows:

Chapter 2: Strategic and policy framework	Outlines the existing planning framework impacting on the Epping town centre, including the Priority Precinct planning process.
Chapter 3: Epping's economic profile	Reviews the current and projected economic profile for Epping as a residential and employment centre.
Chapter 4: Market trends and drivers	Analyses macroeconomic and local trends impacting on office, retail and other commercial uses, including findings from consultation with relevant stakeholders
Chapter 5: Retail demand assessment	Calculates demand for retail floorspace in the Epping town centre and surrounds to 2036.
Chapter 6: Office demand assessment	Calculates demand for office floorspace in the Epping town centre and surrounds to 2036.
Chapter 7: Implications and directions	Outlines the proposed role and function of the Epping town centre and recommends strategies to achieve this vision.

An Appendix has also been included listing recent retail developments in Epping town centre and the local retail market.

2 STRATEGIC AND POLICY FRAMEWORK

2.1 Current planning context

NSW strategies and policies

A Plan for Growing Sydney (2014)

A Plan for Growing Sydney is the primary strategic planning document for metropolitan Sydney, guiding and shaping development of the city to 2031.*A Plan for Growing Sydney* has four goals to deliver new housing and employment across the metropolitan area:

- a competitive economy with world class services and transport;
- a city of housing choice with homes that meet our needs and lifestyles;
- a great place to live with communities that are strong, healthy and well connected; and
- a sustainable and resilient city that protects the natural environment and has a balanced approach to the use of land and resources

A Plan for Growing Sydney identifies the Epping town centre as one of its 10 Priority Precincts. Priority Precincts were chosen based on their alignment with housing, employment and urban renewal strategies, their potential to capitalise on existing infrastructure, their importance to more than one LGA, their environmental, social and economic sustainability, and potential development of the area being consistent with market demand. The *Plan* outlines the intent of the NSW Government to match expected population growth with new infrastructure, schools, recreation facilities and improved public roads and services. Further detail of the planning of the Epping Priority Precinct is included below.

Epping is also identified in the *Plan* as part of the North West Rail Link corridor (now known as Sydney Metro Northwest). The corridor is intended to be a focus for increased housing, economic activity and social infrastructure, and is noted as being important for its accessibility to the Global Economic Corridor.

Towards Our Greater Sydney 2056 and Draft West Central District Plan (2016)

In 2016, the Greater Sydney Commission (GSC) released draft District Plans. These plans sit under *A Plan for Growing Sydney* and provide further detail for planning each of Sydney's six districts. The GSC also released a draft amendment to *A Plan for Growing Sydney* setting out a vision for the metropolitan area to 2056.

One of the crucial concepts and metropolitan priorities of *Towards our Greater Sydney 2056* is the a 30-miunte city. This plan intends to increase the range of jobs and services and other opportunities that people can get to within 30 minutes from their place of residence. A 30-mintue city intends to improve the quality of life of Greater Sydney residents and improve accessibility and transport outcomes across the metropolitan area.

The draft District Plans contain a three-level hierarchy of centres:

- Strategic centres
- District centres
- Local centres

Strategic centres are the most significant centres across Greater Sydney and generally contain at least 20,000 jobs. Strategic centres meet one of the following criteria:

- a higher proportion of knowledge-economy jobs, principally relating to the presence of major hospitals, tertiary education institutions, stand-alone office development or a combination of these
- the presence of existing or proposed major transport gateways
- a major role in supporting the increased economic activity of the Eastern, Central or Western Cities.

Examples of Strategic centres include Greater Parramatta, Sydney Olympic Park and Macquarie Park.

District centres are defined by one of the following characteristics and generally contain between 5,000 and 10,000 jobs:

- the scale of retail activity, generally over 50,000m^2 of floor space
- the presence of health and education facilities that serve the district and the local community
- the level of transport services

Examples of District centres include Hornsby, Castle Hill and Burwood.

Under the *Draft West Central District Plan,* Epping is identified as a local centre. Local centres are defined in the draft District Plans as varying in size from a few shops on a corner to a vibrant main street and generally serving the local population.

The *Draft West Central District Plan* identifies Epping as one of the local centres that will support the Greater Parramatta and Olympic Peninsula (GPOP). The renewal and revitalisation of Epping town centre is identified as one example of the major changes happening in the district that have involved concurrent investment in growth and renewal opportunities. Along with Merrylands, Epping is identified as a local centre 'that, with the right planning and investment, could reach their potential as emerging commercial and retail nodes' (page 48).

The forecast for the town centre under the *Draft Plan* is for up to 3,750 dwellings to be delivered. One of the key actions identified for the Parramatta LGA is also to progress the delivery of urban renewal in the Epping town centre. No employment targets are provided.

Local planning controls

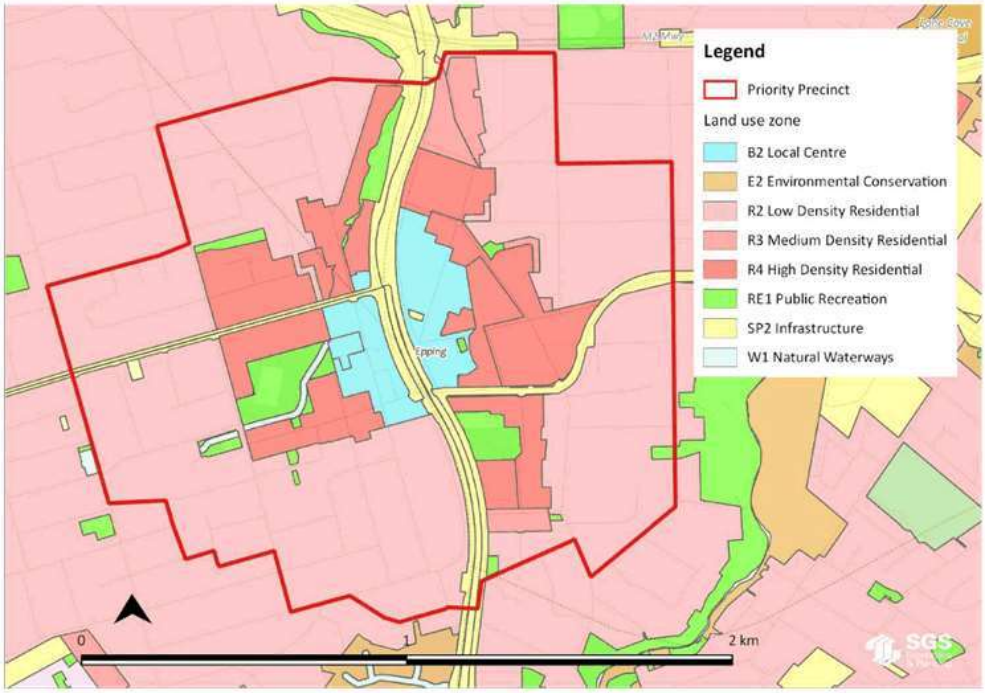
Current zoning and LEP controls

The current LEP controls contained in the *Parramatta Local Environmental Plan 2011* and the *Hornsby Local Environmental Plan 2013* have resulted from the Priority Precinct planning process and have largely been harmonised across the two environmental planning instruments.

The current zoning for the Epping town centre area is shown in Figure 2, where the B2 Local Centre zoned areas represent the focus for retail and commercial uses in the centre. The B2 Local Centre zone permits the following uses with consent:

- Commercial development (including office, retail and other businesses)
- Residential development in the form of shop top housing, boarding houses or seniors housing
- Tourist and visitor accommodation
- Community facilities
- Services such as child care centres, schools, recreation facilities, medical centres and function centres

FIGURE 2. LAND ZONING, EPPING TOWN CENTRE



Source: SGS, 2017.

The objectives of the B2 zone under the Hornsby LEP 2013 are to:

- Provide a range of retail, business, entertainment and community uses that serve the needs of people who live in, work in and visit the local area,
- Encourage employment opportunities in accessible locations, and
- Maximise public transport patronage and encourage walking and cycling.[1]

In addition to these, the Parramatta LEP 2011 includes the objective for the B2 zone to:

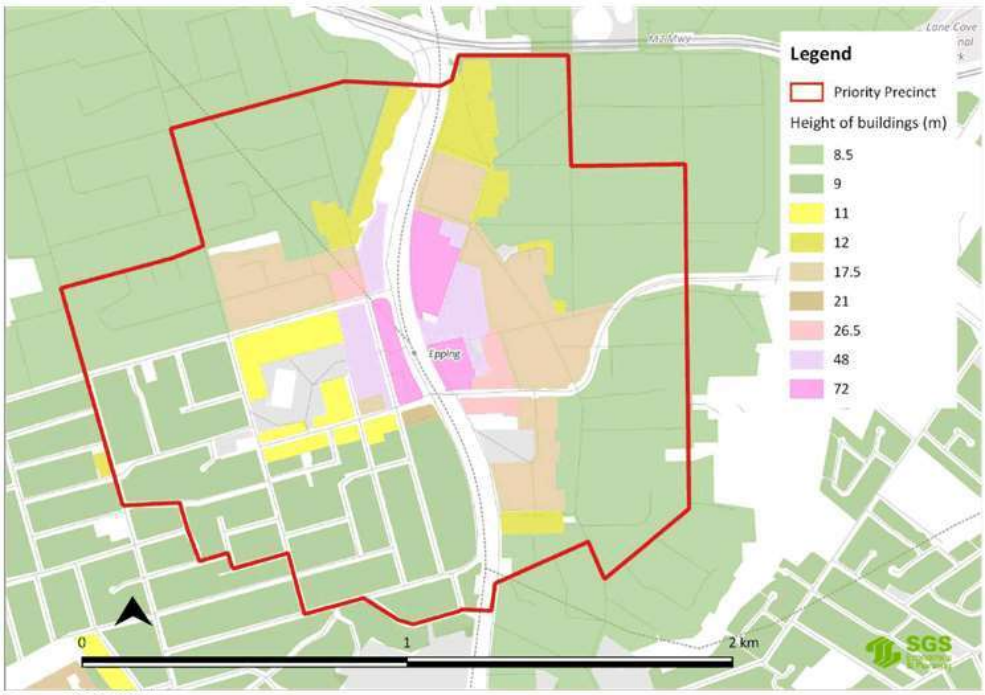
- Encourage the construction of mixed use buildings that integrate suitable commercial, residential and other developments and that provide active ground level uses.[2]

[1] Hornsby Local Environmental Plan 2013, http://www.legislation.nsw.gov.au/#/view/EPI/2013/569/full

[2] Parramatta Local Environmental Plan 2011, http://www.legislation.nsw.gov.au/#/view/EPI/2011/540/full

The current maximum building heights for the town centre core under the LEPs are shown in Figure 3. The B2 zoned areas closest to the rail line and Beecroft Road have a maximum height of 72 metres (approximately 22 storeys). Surrounding B2 Local Centre zoned land has a maximum height of buildings of 48 metres (approximately 15 storeys).

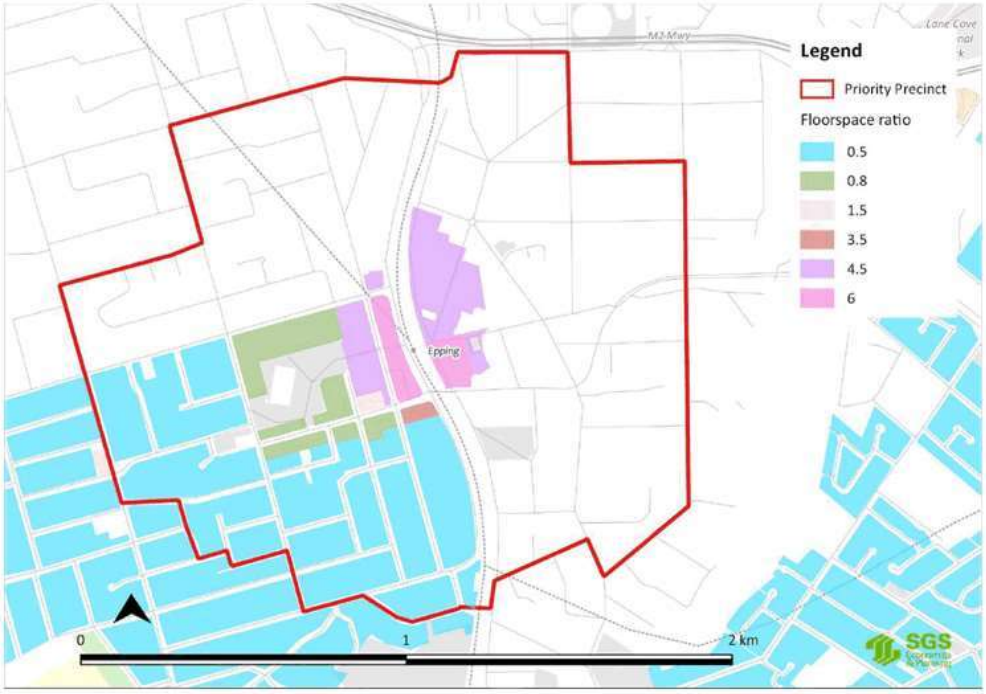
FIGURE 3. BUILDING HEIGHTS, EPPING TOWN CENTRE



Source: SGS, 2017.

Figure 4 shows the current floor space ratios (FSR) in Epping. Two sections close to the railway and Beecroft Road have a FSR of 6:1. These sites have a maximum height of building for 72 metres. The rest of the B2 Local Centre zoned land has a FSR of 4.5:1. Land zoned R4 High Density Residential in the former Hornsby local government area do not have FSR controls. R4 High Density Residential land in the former Parramatta City Council local government area have FSR controls ranging from 0.8:1 to 0.5:1.

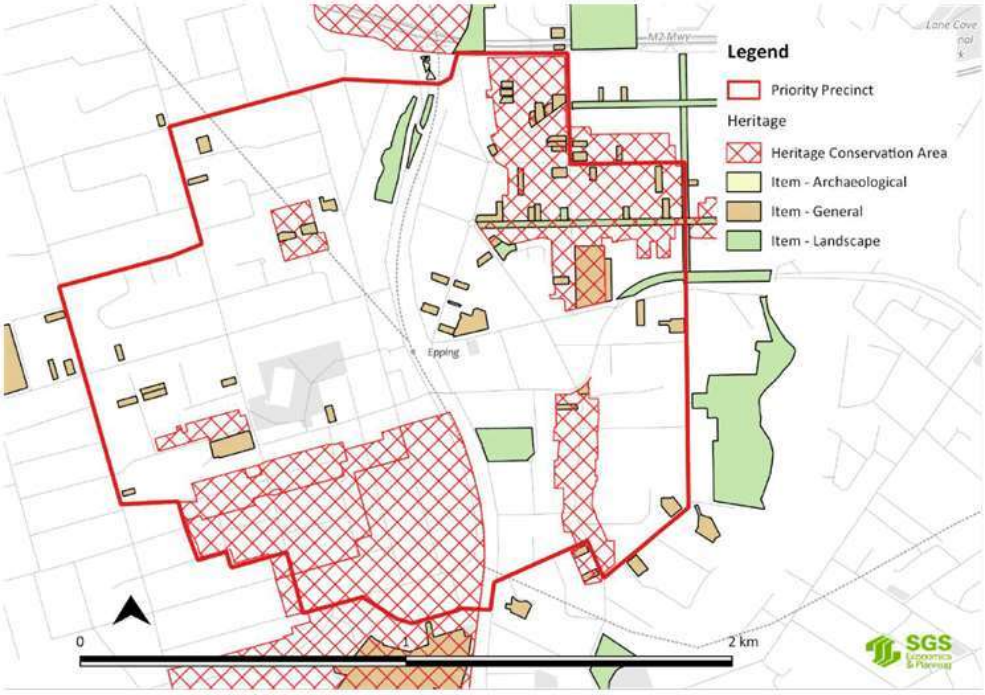
FIGURE 4. FLOOR SPACE RATIO, EPPING TOWN CENTRE



Source: SGS, 2017.

Heritage items identified in the LEPs are shown in Figure 5. There are several local heritage items along Oxford Street, including The School of Arts building, St Albans church, some shopfronts and some houses now used for non-residential purposes. Forest Park to the south of the Epping town centre and bushland to the north are identified as landscape heritage items under the *Hornsby Local Environmental Plan 2013*. The town centre and R4 High Density Residential zoned land are surrounded by heritage conservation areas to the south, east and north. The heritage conservation areas also contain heritage items of local and/or landscape significance.

FIGURE 5. HERITAGE, EPPING TOWN CENTRE



Source: SGS, 2017.

The current library site is subject to additional permitted uses under Schedule 1 of the *Hornsby Local Environmental Plan 2013*. Residential flat buildings are permitted with consent provided that the consent authority is satisfied that the ground floor uses of the building would be used only for the purposes of a community facility.

DCP controls

The *Parramatta Development Control Plan 2011* and *Hornsby Development Control Plan 2013* identify Epping as a commercial town centre providing services to a wide local catchment. The two DCPs identify the following common elements in the desired future character for Epping:

- Compact, walkable and vibrant urban centre
- Mix of residential, commercial and retail uses
- Main street, fine grain retail development with high quality public domain. New development is expected to contribute positively to the public domain.
- Preservation and enhancement of local heritage items and character
- High quality built form, especially concerning high density development forms.

The *Parramatta Development Control Plan 2011* emphasises the need for high quality, slim-line towers fronting Rawson Street and Beecroft Road, with existing heights and densities in Boronia Park to remain and act as a buffer between high and low density areas. The human scale is also a significant consideration, with appropriate setbacks to avoid dominating the street, and improving pedestrian connections across the Epping town centre either side of the rail line.

The *Hornsby Development Control Plan 2013* also emphasises the activation of ground floor uses with specific controls regarding the use of outdoor dining and use of the footpath for retail uses and maintenance of a main street retail urban form.

Both DCPs contain detailed controls for setbacks (both at street level and raised podiums), locations for active street frontages, open spaces (both private and public), landscaping and street frontage widths.

The *Parramatta Development Control Plan 2011* specifically encourages the amalgamation of lots to ensure orderly development and identified existing and planned pedestrian connection networks through the town centre.

Both the *Parramatta Development Control Plan 2011* and *Hornsby Development Control Plan 2013* contain development controls requiring a 2 to 3 storey podium element for development in the B2 Local Centre zone with a tower development above the podium. This podium control aims to deliver a human-scale development as well as provide space for non-residential floorspace within the first 2 to 3 storeys of the development.

The two DCPs contain different parking requirements for new development in the Epping town centre. Table 1 outlines the parking requirements as per the *Parramatta Development Control Plan 2011* and *Hornsby Development Control Plan 2013*.

The *Parramatta Development Control Plan 2011* requires parking to be provided in basements on B2 Local Centre and R4 High Density Residential zoned land. The *Hornsby Development Control Plan 2013* requires resident and visitor parking to be located underground and encourages at grade parking for shoppers.

TABLE 1. CURRENT PARKING REQUIREMENTS IN EPPING

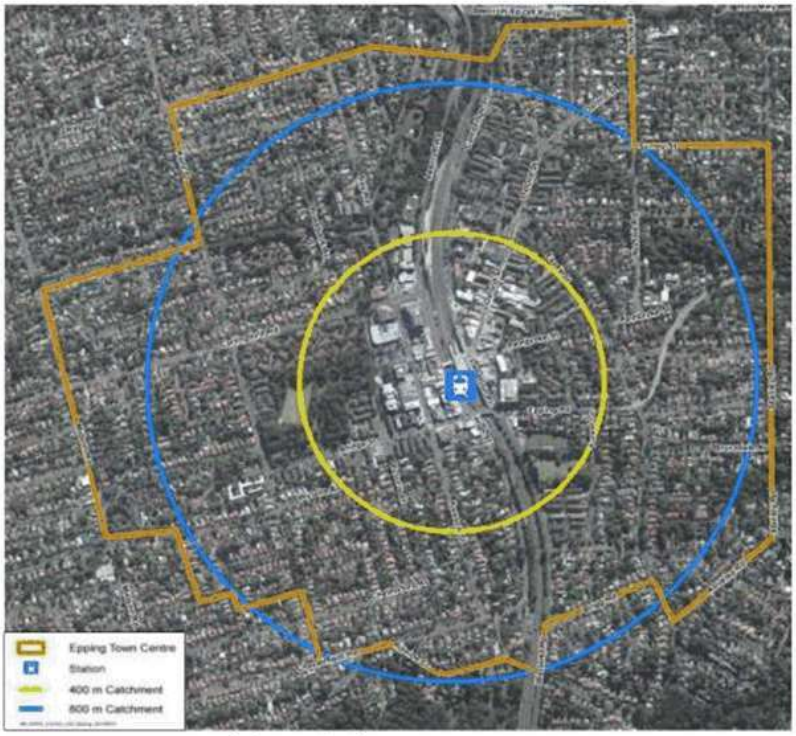
Category	*Parramatta Development Control Plan 2011*	*Hornsby Development Control Plan 2013*
Residential (per dwelling)	0.5 spaces – Studio 0.75 spaces – 1 bedroom 1 space – 2 bedrooms 1.5 spaces – 3 or more bedrooms 1 space for every 10 dwellings for visitors 1 space for every 50 dwelling for car share	0.75 spaces – 0-1 bedroom 1 space – 2 bedrooms 1.5 spaces – 3 or more bedrooms 1 space for every 7 dwellings for visitors
Retail and hospitality	Minimum of 1 space per 60m² of gross floor area, maximum of 1 space per 30m² of gross floor area	1 space per 29m² of gross lettable floor area
Commercial	Minimum of 1 space per 70m² of gross floor area, maximum of 1 space per 50m² of gross floor area	1 space per 48m² of gross floor area
Medical uses	Minimum of 1 space per 70m² of gross floor area, maximum of 1 space per 50m² of gross floor area	3 per surgery – health consulting rooms 4 per surgery – medical centres
Bulky goods premises	Minimum of 1 space per 60m² of gross floor area, maximum of 1 space per 30m² of gross floor area	1 space per 75m² of gross lettable floor area

Source: *Parramatta Development Control Plan 2011, Hornsby Development Control Plan 2013*
Note: Parking rates under the *Hornsby Development Control Plan 2013* shown are for development within 800m of the train station. Higher rates apply further from the train station.

Epping UAP/Priority Precinct Process

As noted above, Epping has been identified as one of 10 Priority Precincts (formally Urban Activation Precincts) by the NSW Government. The Epping town centre was identified as an Urban Activation Precinct in 2012 by then Department of Planning and Infrastructure (now Department of Planning and Environment (DPE)). The Epping town centre Urban Activation Precinct boundary is shown in Figure 6.

FIGURE 6. EPPING TOWN CENTRE URBAN ACTIVATION PRECINCT



Source: NSW Department of Planning & Infrastructure, 2013.

Background studies

The *Epping town centre Study* was completed in 2011. The purpose of this study was to enable Epping to fulfil its role as a town centre in the Sydney metropolitan context and to maximise the benefits arising from State Government infrastructure investment.

At the time of the study, Epping supported around 12,900 square metres of retail floorspace, and around 55,000 square metres of commercial office floorspace, as well as schools and other community facilities. It was identified that with the planning controls of the time, there was limited potential for increased development in the catchment area, but that there were few environmental constraints that would limit greater residential intensification.

The study identified that most office developments in the Epping town centre were concentrated in three precincts in larger floorplate developments. These three precincts were largely located on the edges of the centre. The Study noted that while there was a larger amount of office space than would typically be provided in a town centre, Epping would be unlikely to compete and be able to attract significant additional employment growth because of its proximity to larger and well-established employment centres.,.

The study also argued that demand for larger, higher grade floorplates would result in reduced demand for the type of space on offer in Epping, and that larger commercial sites in the centre would provide redevelopment opportunities, particularly for housing and retail uses.

The study also noted that retail uses were concentrated along Rawson Street, Oxford Street, Beecroft Road, Bridge Street and Langston Place, with the western side of the railway line accommodating the

majority (85%) of retail floorspace. A number of issues for the area in terms of its retail market were identified, including traffic congestion limiting both vehicular and pedestrian access, and trade being lost to surrounding centres.

Planning the Priority Precinct

As part of the process of rezoning the Epping town centre, a number of key issues were raised with the DPE. These include height and density controls, public space, traffic, heritage items and conservation areas, and the additional services such as schools that would be required. The *Finalisation Report* outlines the changes to the planning controls, which primarily included:

- Mixed use commercial and residential buildings in the core area within 400 metres of the railway station, permitting building up to 22 metres high and FSR's up to 6:1,
- The introduction of 5 residential intensification precincts within the wider town centre precinct, allowing for buildings up to 5 storeys, and
- The introduction of new and expanded heritage conservation areas, applicable to 30% of the precinct.

Changes to the proposal between the *Planning Report* and the *Finalisation Report* increased the estimated dwelling yield within the precinct from 3,600 to 3,750. Development of the Epping town centre under these controls was found to be feasible, including with increased Section 94A contributions to fund local infrastructure improvements, reflecting the strength of the residential market.

A key concern that was raised in the planning process was that the rezoning would reduce the amount of commercial floorspace in the precinct, and thus reduce employment opportunities. However, it was recommended that no changes be made to the proposed B2 areas, and that market demand would dictate the volume of commercial and other uses within the town centre. It was noted that there would likely be less demand for larger floor plate uses in Epping due to the popularity of nearby centres such as Macquarie Park and Norwest Business Park, but that there would still be demand for smaller commercial premises.

A feasibility study prepared as part of the finalisation of the UAP envisaged a strong retail focus of the Epping town centre servicing the local residential and employee population. The feasibility report suggested that there would be significant opportunities for retailers including cafés and restaurants to be included as part of future developments given the area's expected population growth. The development of commercial office floorspace is not included in the assessment.

The council-owned car park adjacent to Boronia Park was subject to specific masterplanning as part of the Priority Precinct planning process. Sites adjacent to the carpark, including the supermarket and office building, were included in this masterplanning process in consultation with these land owners. While in general the new planning controls introduced through the Priority Precinct planning process would allow for feasible development, it was also suggested that on the Council site, towers well-exceeding the allowable heights would be needed for any development to remain feasible and deliver on open space requirements. The masterplanners recommended that greater FSR's or building heights only be permitted where significant public benefits are provided, such as in public domain improvements.

Vision for Epping as a Priority Precinct

The vision for the Epping Priority Precinct contained in the planning reports prepared by DPE is for a revitalised precinct, accommodating 3,750 new homes within a 10 minute walk of existing public transport, employment and local services. This vision includes:

- A compact high density town centre core, where the majority of new dwellings are within the core, tall buildings are setback from streets, and where a range of retail and commercial activities occur at lower levels and service the local population,
- Increased residential densities adjoining the town centre, to allow for apartment buildings of 2-6 storeys in new residential areas, and for the retention of existing high, medium and low density areas,
- Heritage conservation areas and items to not be subject to increased dwelling densities,
- A revitalised public domain to create a lively centre, with improvements and the establishment of new public spaces in specific streets, and

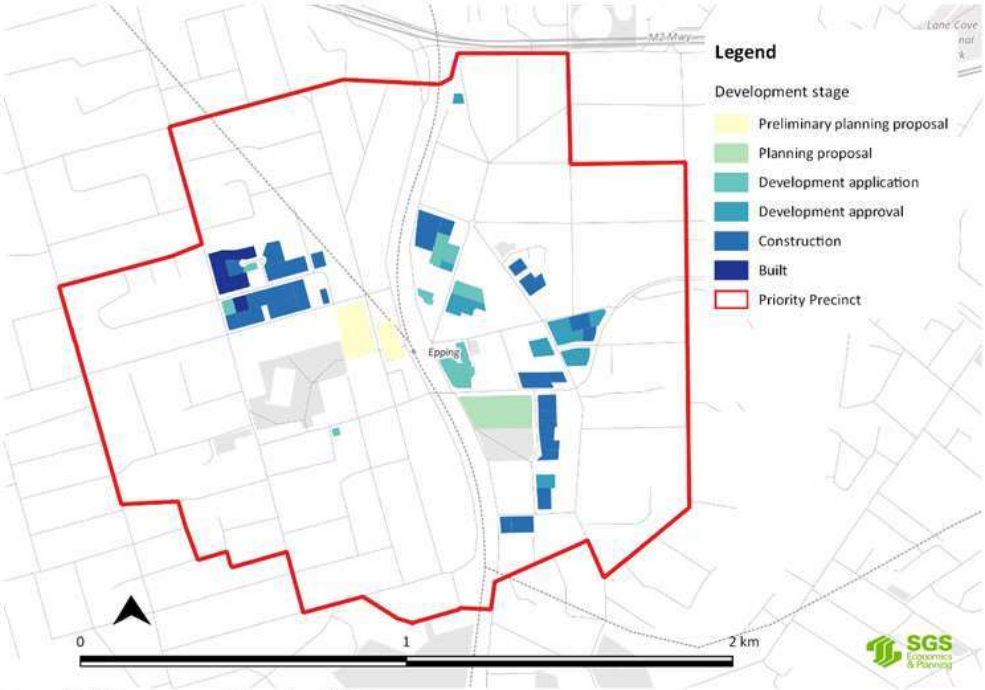
– Improved connections, especially for pedestrians and cyclists.

Recent development and proposals

The redevelopment opportunities identified in the 2011 *Epping Town Centre Study* have started to occur, with the commercial precincts to the north of the town centres currently being redeveloped for residential purposes.

Development to date has been concentrated around Cliff Road on the western side of the precinct, and around Forest Grove, Epping Road, and Pembroke Street in the south-east. The location of planning proposals and development applications in Epping town centre and their stage of development is shown in Figure 7.

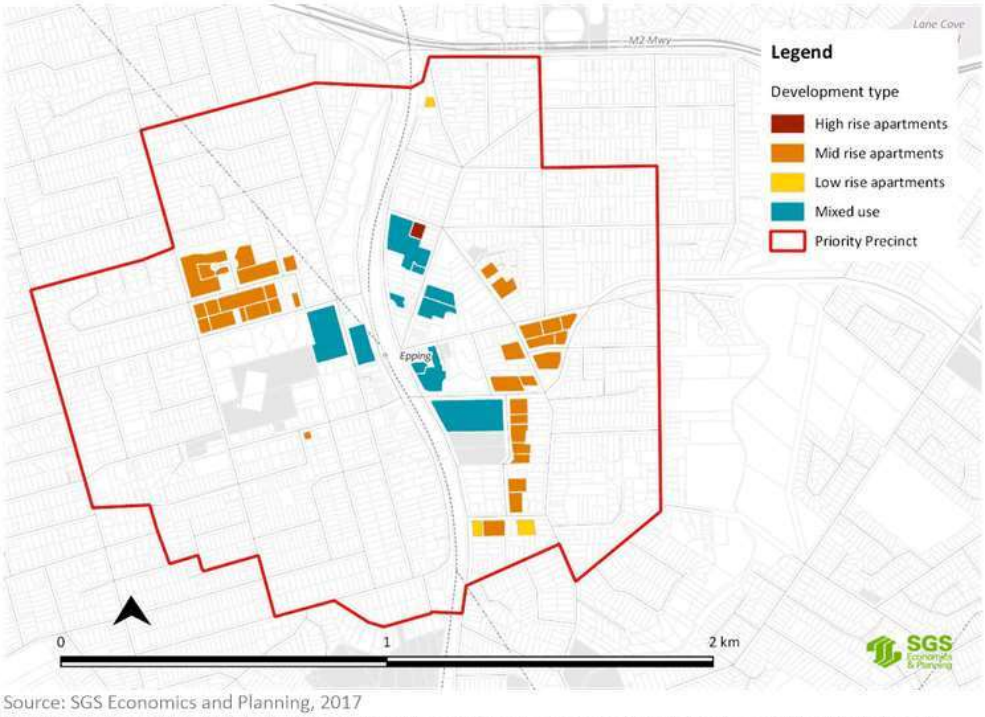
FIGURE 7. DEVELOPMENT ACTIVITY IN THE EPPING TOWN CENTRE



Source: SGS Economics and Planning, 2017

Following the designation of Epping as a Priority Precinct and the subsequent rezoning to concentrate growth around the railway station, much of the development activity and development in the pipeline is for high density residential uses and mixed use buildings with ground floor commercial uses and residential development from the second storey up. This differs from the DCP controls requiring the first 2 to 3 storeys for non-residential floorspace. Figure 8 below shows the location and type of development included in recent development applications.

FIGURE 8. DEVELOPMENT TYPE IN THE EPPING TOWN CENTRE



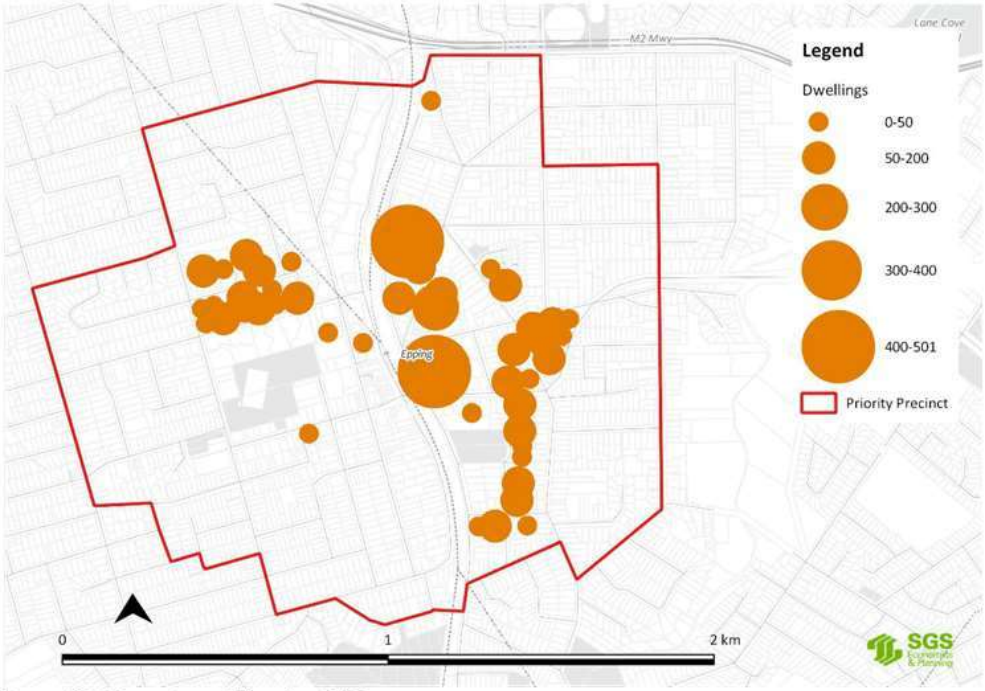
Source: SGS Economics and Planning, 2017
Note: Low rise includes residential development up to 3 storeys, mi rise includes development between 4 and 7 storeys, high rise includes 8 storeys and higher.

The Epping Priority Precinct is forecast to have the potential for 5,530 dwellings by 2036. This is 1,780 dwellings above the final vision for the Priority Precinct of 3,750 dwellings published in 2014. In the period to December 2016, there were 43 development applications lodged, including a total of 3,855 apartments. A total of 39 of these have been approved, including 3,157 apartments. The approved dwellings at the time of writing represent approximately 57% of all dwelling potential for the Epping Priority Precinct.

Of the developments approved or under construction, the number of dwellings has ranged from 12 up to 464. At the time of writing, City of Parramatta Council is considering a pre-lodgement development application containing 501 dwellings in the Epping town centre.

Figure 9 below shows the location of approved new dwellings in the Epping Priority Precinct. Clusters of residential development are evident in areas zoned R4 High Density Residential around the town centre and on the eastern side of the Epping town centre.

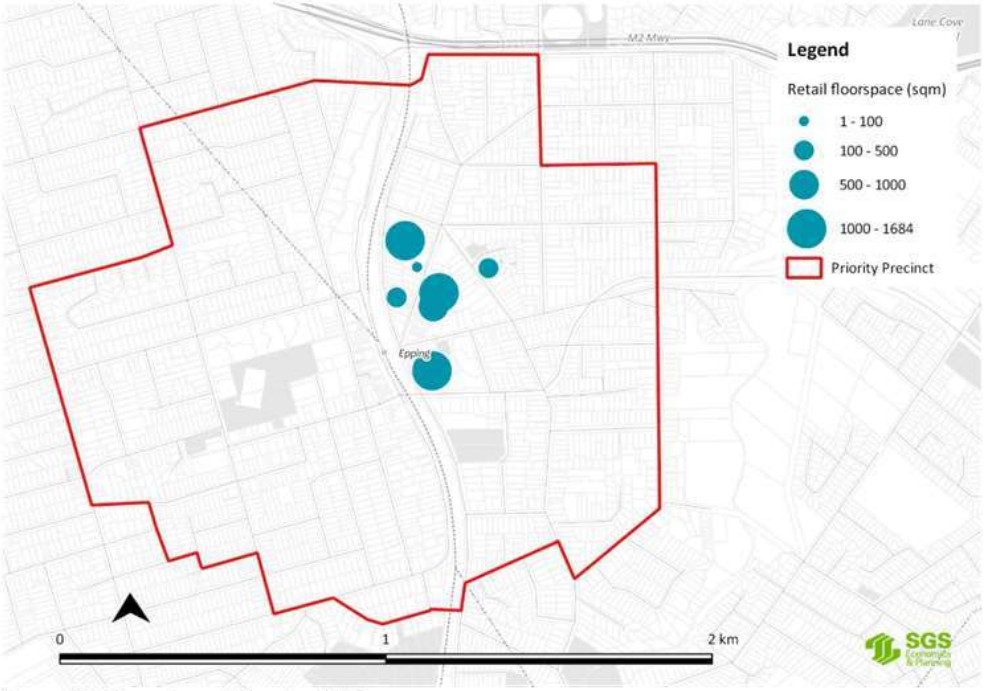
FIGURE 9. DWELLING NUMBERS IN RECENT DEVELOPMENT APPLICATIONS IN THE EPPING TOWN CENTRE



Source: SGS Economics and Planning, 2017

Recent development applications in the Epping town centre contain limited floorspace for retail and/commercial uses. Figure 10 below shows the location and square metres of retail and/or commercial floorspace included in recent development applications. This floorspace is included on the ground floor or upper ground floor of developments on sloping sites. Retail floorspace proposed in recent development applications is solely located on the eastern side of the Epping town centre.

FIGURE 10. RETAIL AND/OR COMMERCIAL FLOORSPACE IN RECENT DEVELOPMENT APPLICATIONS IN THE EPPING TOWN CENTRE



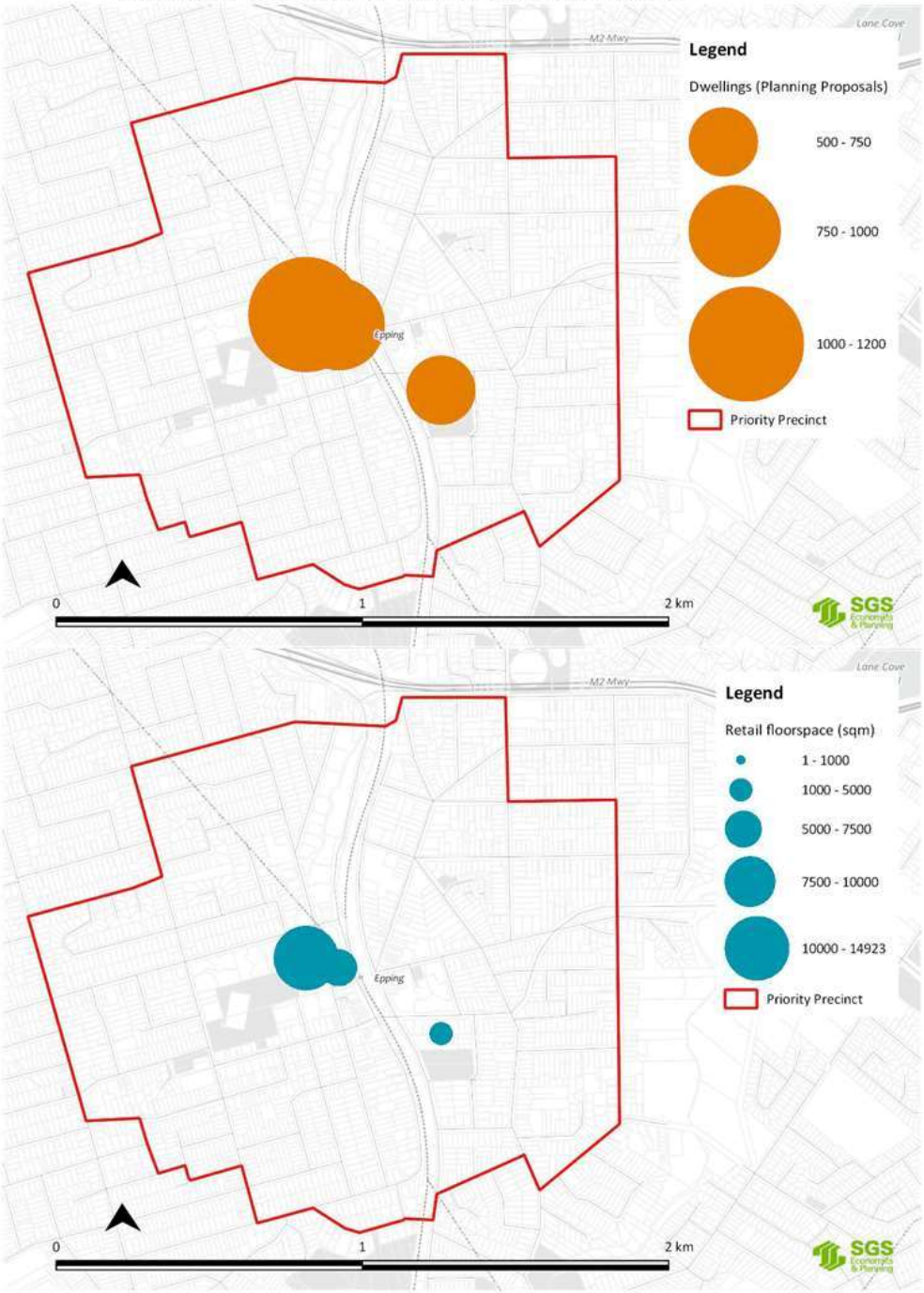
Source: SGS Economics and Planning, 2017

Recent planning proposals received by City of Parramatta Council (both preliminary and formal applications) seek to increase the height of buildings and floorspace ratios applicable to different sites in the Epping town centre. In one case, the planning proposal also seeks to change the zone of the affected lots from B2 Local Centre to B4 Mixed Use.

Due to the nature of planning proposals, the exact specifications of the future land uses are not known. Figure 11 below provide an indication of the capacity for residential floorspace (by dwellings) and retail/commercial floorspace (by square metres) respectively. The proposed height of buildings and floorspace ratios are significantly higher than what is permissible under the current planning controls and, as such, the dwelling capacity proposed is significantly higher than the current development applications.

Recent planning proposals largely discuss shop top housing as the likely land use on the subject sites. The quantum of dwellings and commercial floorspace is taken from the planning proposal documents.

FIGURE 11. DWELLING NUMBER AND RETAIL FLOORSPACE CAPACITY IN CURRENT PLANNING PROPOSALS IN THE EPPING TOWN CENTRE



Source: SGS Economics and Planning, 2017

2.2 Summary

Review of the current LEPs and DCPs applicable to the Epping town centre suggests that local government plans for the area define it as an important commercial and retail centre, providing local employment opportunities. State level policy around Epping, particularly its designation as a Priority Precinct, is more focused on the town centre accommodating high density residential development with some mixed use functions rather than maintaining Epping's historic office employment function.

Epping's proximity to key destinations and employment locations via rail, such as Macquarie Park, North Sydney and the Sydney CBD, is a strong strategic advantage for the town centre, particularly with the establishment of the Metro Northwest link. However, while Epping's transport accessibility is rated highly, it has declined as a commercial office given newer and larger centres nearby (including Parramatta and Macquarie Park). Planning controls in these centres typically include zones which prohibit residential development and these have supported the growth of office employment. Epping in contrast has mixed use zones which allow residential and has therefore transitioned away from its previous role as a commercial office location.

Analysis of recent development in and around the town centre shows that the vast majority of planning proposals and development applications are focused on establishing high density residential dwellings, with in some cases commercial and retail included on the ground floor as part of mixed use buildings. A number of these proposals have also sought to develop sites above the building height and FSR limits introduced under the Priority Precinct planning process outlined in both the Parramatta and Hornsby LEPs.

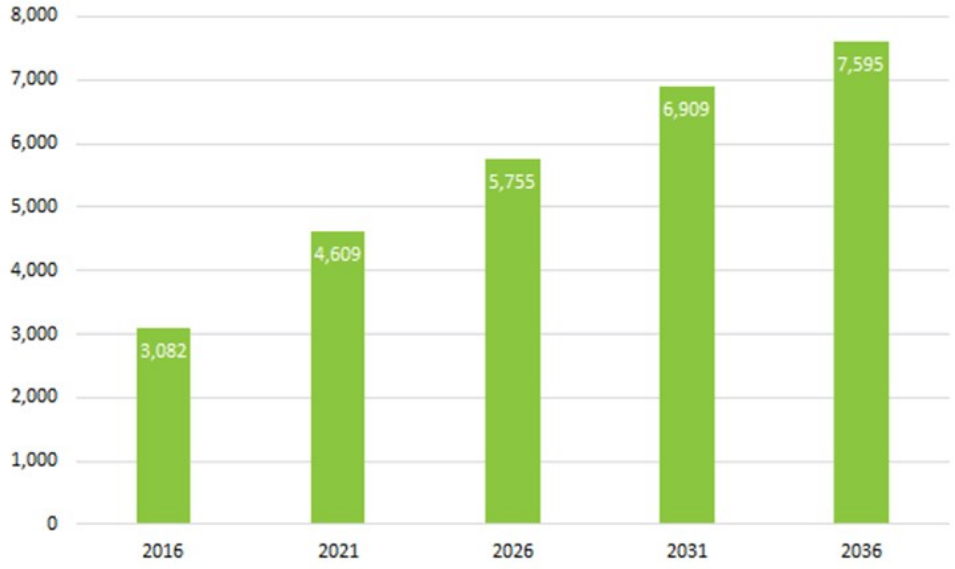
This trend, along with policies at the State level which are focused on providing more housing, is likely to have implications for the provision of floorspace in the Epping town centre in future. If current development trends continue, Epping town centre is likely to continue to lose its commercial floorspace, to residential floorspace in mixed use developments. However, retail floorspace is likely to remain constant as mixed use developments with ground floor retail replace existing shop fronts.

3 EPPING'S ECONOMIC PROFILE

3.1 Socioeconomic factors

The Epping town centre's population is forecast to more than double between 2016 and 2036. The town centre is forecast to increase at a compounded annual growth rate of 4.61% to grow to 7,595 residents by 2036. The forecast population growth of the Epping town centre is shown in Figure 12[3].

FIGURE 12. FORECAST POPULATION GROWTH



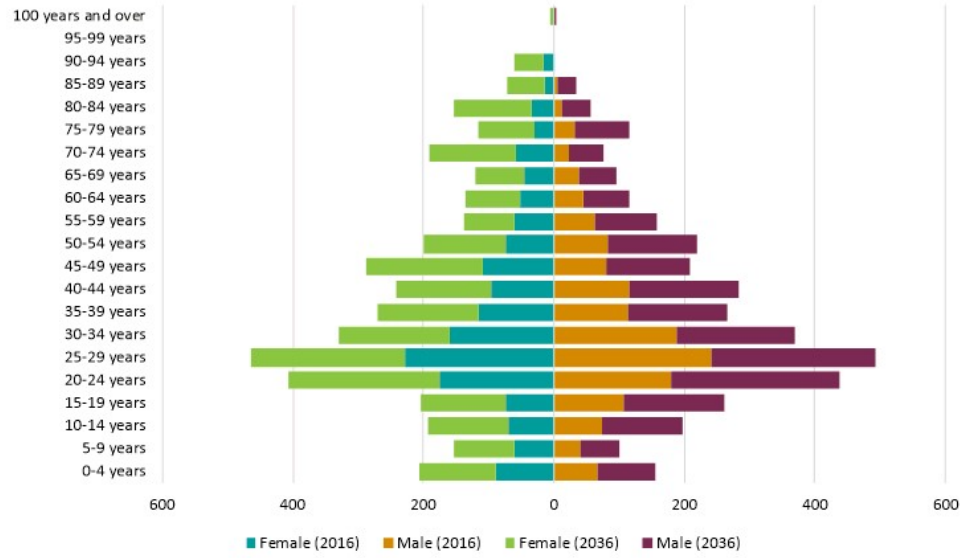
Source: SGS, 2017, using TPA, 2016

Forecast population by age and sex is shown below in Figure 13. At 2016, Epping has significant proportions of young adults aged between 20 and 34. These age groups dominate the Epping town centre's population mix.

While significant increases are forecast for the elderly population (i.e. those aged 75 years and over) and children at 2036, the age of residents remains skewed towards a young adult population. This reflects the nature of development proposed in the Epping town centre outlined in Chapter 2 and the proximity of Epping to employment and higher education facilities.

[3] It is noted that City of Parramatta Council has prepared an analysis of projected population in the Epping town centre based on development application data. This differs from the population projection used in this report, which have been prepared by NSW Transport Performance and Analytics for land use forecasts across Greater Sydney. The methodologies differ between the two forecasts.

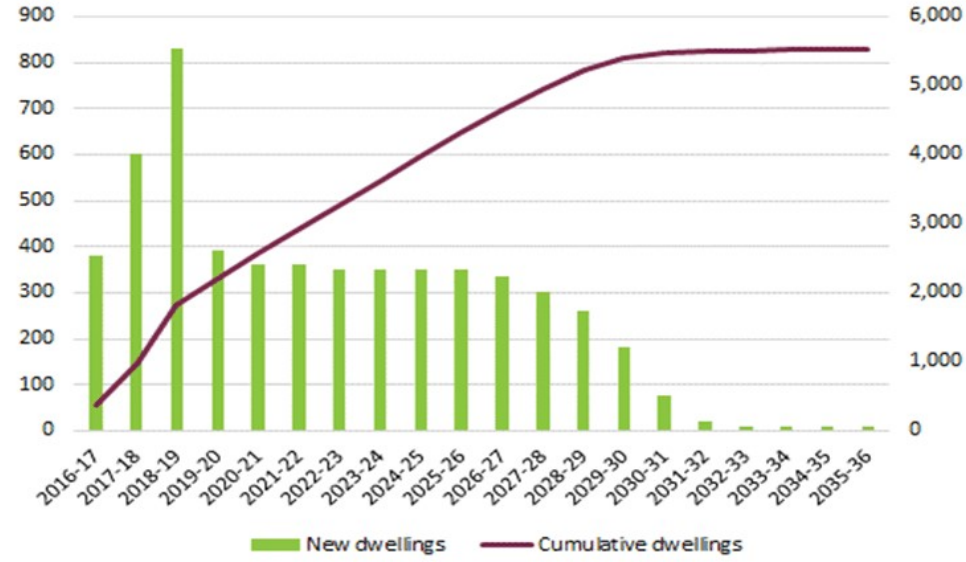
FIGURE 13. FORECAST POPULATION GROWTH BY AGE AND SEX



Source: SGS, 2017, using TPA, 2016

Figure 14 below shows the dwellings by year to 2036 forecasted by the Department of Planning and Environment. The Epping Priority Precinct is forecast to include an additional 5,530 dwellings between 2016 and 2036. The majority of these new dwellings are forecast to be developed in the next 6 years, with an additional 2,920 dwellings forecast between 2016/17 to 2021/22. There is potential for these additional dwellings to be developed earlier than forecast in light of recent development application activity in the Epping town centre.

FIGURE 14. FORECAST NEW DWELLINGS



Source: SGS, 2017, using DPE, 2016

The participation rate of the resident workforce is shown below in Table 2. The current labour participation rate of residents of the Epping town centre (72.11%) is currently above average for the City of Parramatta local government area (70.16%) and comparable to labour participation across Greater Sydney (72.27%). The proportion of residents engaged in the workforce is forecast to increase between 2016 to 2036, from 72.11% to 76.48%.

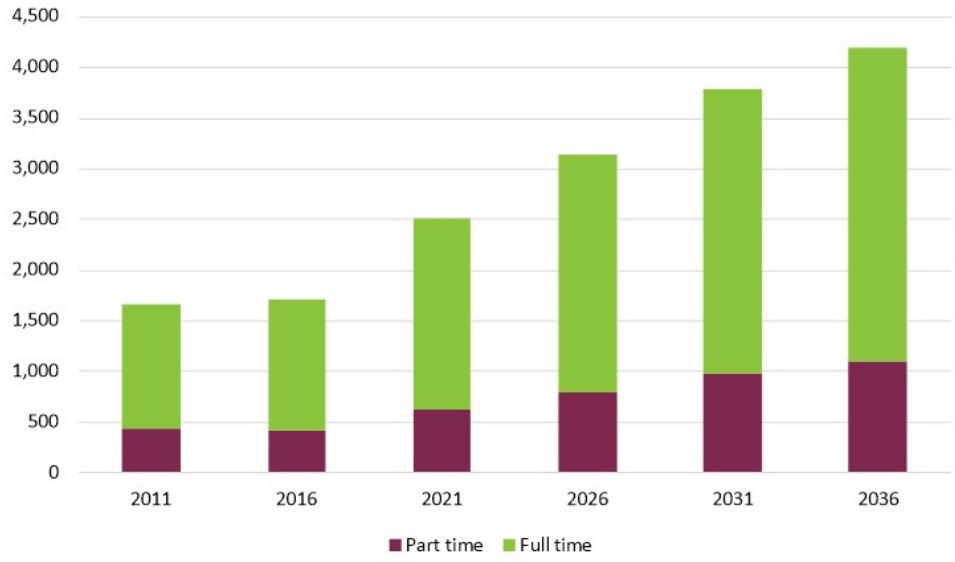
TABLE 2. LABOUR PARTICPATION RATE OF THE RESIDENT WORKFORCE

	2016	2036
Epping town centre	1,706	4,201
Labour force participation rate	72.11%	76.48%

Source: SGS, 2017

The split between part time and full time work of Epping town centre residents is forecast to remain constant in the twenty years between 2016 and 2036, as shown in Figure 15. Full time work is forecast to remain the dominant means of employment, accounting for approximately 74% of the resident workforce. Part time work accounts for approximately 26% of employment among the resident workforce of the Epping town centre.

FIGURE 15. RESIDENT WORKFORCE – PART TIME AND FULL TIME WORK



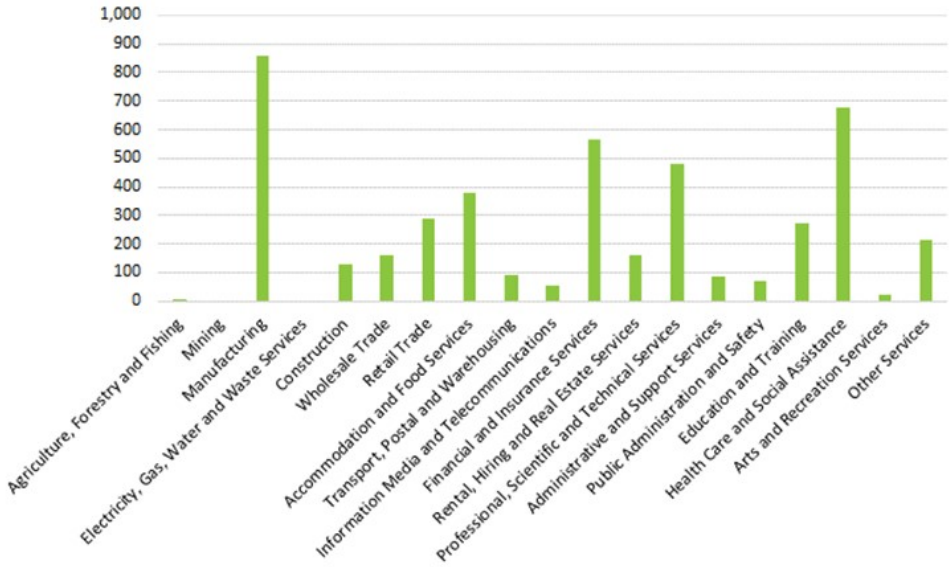
Source: SGS, 2017

3.2 Industry and employment analysis

At the 2011 Census, there were 4,512 jobs in the Epping town centre and a total of 5,550 jobs in the Epping Priority Precinct. Employment in the Epping town centre is shown below in Figure 16.

The majority of these jobs were in Manufacturing, Financial and Insurance Services and Health care and Social Assistance industries. These reflect the significant employers located in Epping at the time of the 2011 Census, such as Unilever (food manufacturing) and Westpac (banking).

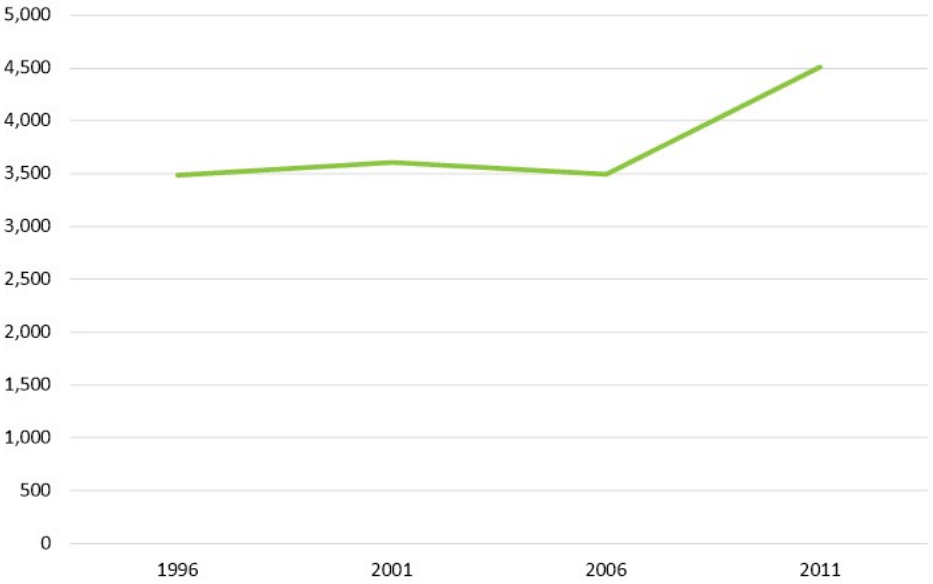
FIGURE 16. EMPLOYMENT BY INDUSTRY IN EPPING TOWN CENTRE



Source: SGS, 2017 using ABS, 2011

Employment in Epping has remained relatively stable in the Epping town centre in the 15 years from 1996 to 2011. Total employment grew from approximately 3,488 to 4,512. Peak employment in recent years was in 2011, when employment grew by 1,021 jobs from 2006.

FIGURE 17. PAST EMPLOYMENT NUMBERS IN THE EPPING TOWN CENTRE



Source: SGS, 2017 using ABS, 2011

The Greater Sydney Commission has established a simplified categorisation of employment in the draft District Plans. These categories provide an indication of where different industries and use locate and cluster across Greater Sydney. These categories are defined in Table 3.

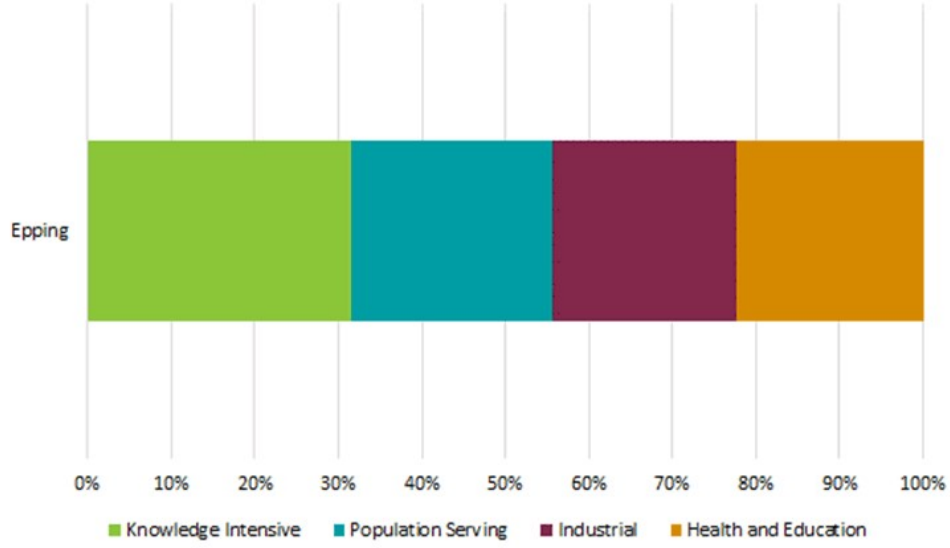
TABLE 3. GSC JOB CLASSIFICATION

Category	ABS Industry Classification (ANZSIC 2006)	Examples
Knowledge Intensive	Information Media and Telecommunications	Major finance and consulting firms, research institutions, government departments and agencies, property and real estate firms, innovation hubs, HR and recruitment firms
	Financial and Insurance Services,	
	Rental, Hiring and Real Estate Services	
	Professional, Scientific and Technical Services	
	Administrative and Support Services	
	Public Administration and Safety	
	Advanced Manufacturing	
Population Serving	Retail Trade	Shops, cafes, restaurants, hotels, art galleries and museums, gyms, sporting facilities, building and construction
	Accommodation and Food Services	
	Arts and Recreation Services	
	Construction	
	Other Services	
Industrial	Agriculture, Forestry and Fishing	Warehouses, logistics, factories, energy plants, peri-urban
	Mining	
	Manufacturing	
	Electricity	
	Gas, Water and Waste Services	
	Wholesale Trade	
	Transport Postal and Warehousing	
Health and Education	Education	Universities, hospitals, medical research, schools, medical clinics
	Health Care and Social Assistance	

Source: GSC, 2016

Epping has a relatively even mix of employment against the four Job Classification categories established by the Greater Sydney Commission in the draft District Plans. Approximately 32.0% of all jobs in Epping fall within the Knowledge Intensive category. The split between Population Serving, Industrial and Health and Education jobs are relatively even, representing 24.1%, 22.0% and 22.4% of all jobs respectively. The breakdown of jobs in Epping is shown in Figure 18.

FIGURE 18. BREAKDOWN OF EMPLOYMENT BY GSC CATEGORIES

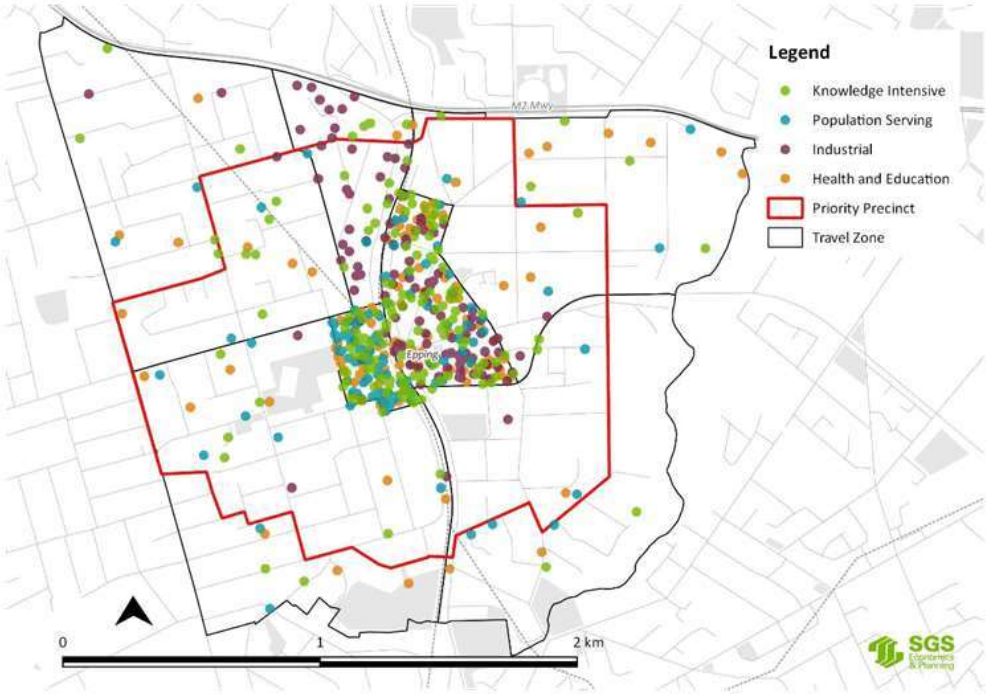


Source: SGS, 2017

The distribution of jobs in Epping by Travel Zone is shown in Figure 19. It must be noted that the dots are randomly allocated within the Travel Zone and do not reflect actual individual job locations. One dot represents 10 jobs as recorded at the 2011 Census.

The majority of jobs in the Epping Priority Precinct are clustered around the Epping town centre at the train station on B2 Local Centre zoned land. This is especially true for Knowledge Intensive and health and Education jobs, which have clustered on both sides of the train station. A cluster of Population Serving jobs is more pronounced on the western side of the station. Conversely, Industrial jobs have largely clustered on the eastern side of the station, presumably within the office park development along Cambridge and Oxford Streets, and to the north of the town centre.

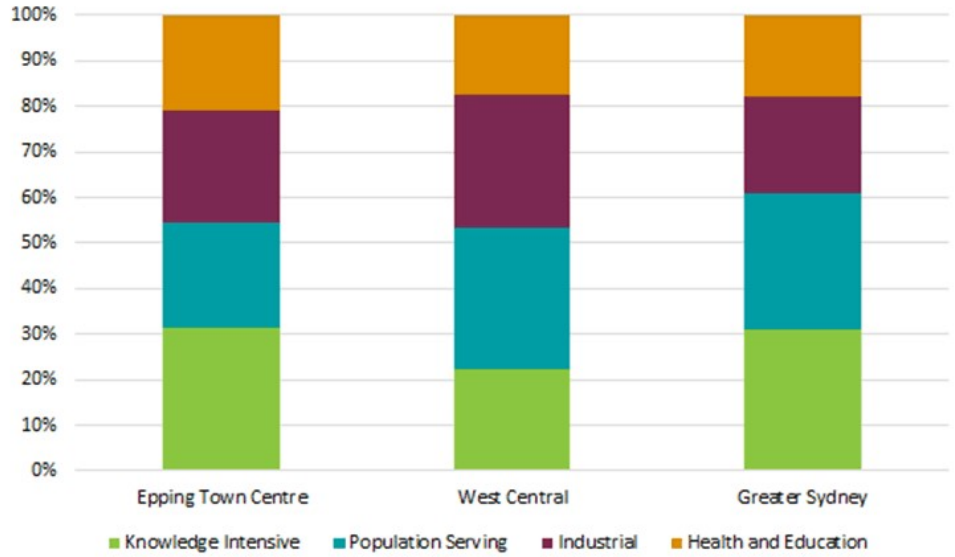
FIGURE 19. INDICATIVE EMPLOYMENT DISTRIBUTION BY TRAVEL ZONE



Source: SGS, 2017
Note: 1 dot = 10 jobs. Dots reflect every 10 jobs in the class within that Travel Zone. Dots are randomly allocated within the Travel Zone and do not reflect actual individual job locations.

A comparison of jobs by GSC job category to the West Central District and Greater Sydney is shown in Figure 20. The Epping town centre has a similar proportion of knowledge intensive jobs to Greater Sydney and a higher proportion compared to the West Central District. Conversely, the Epping town centre's proportion of population serving jobs is lower than the West Central District and Greater Sydney. Epping also has a higher proportion of Health and Education employment. The split of jobs in the Epping town centre indicates that Epping is an accessible location, attracting jobs in industries that do not rely on local populations, such as knowledge intensive jobs in professional services.

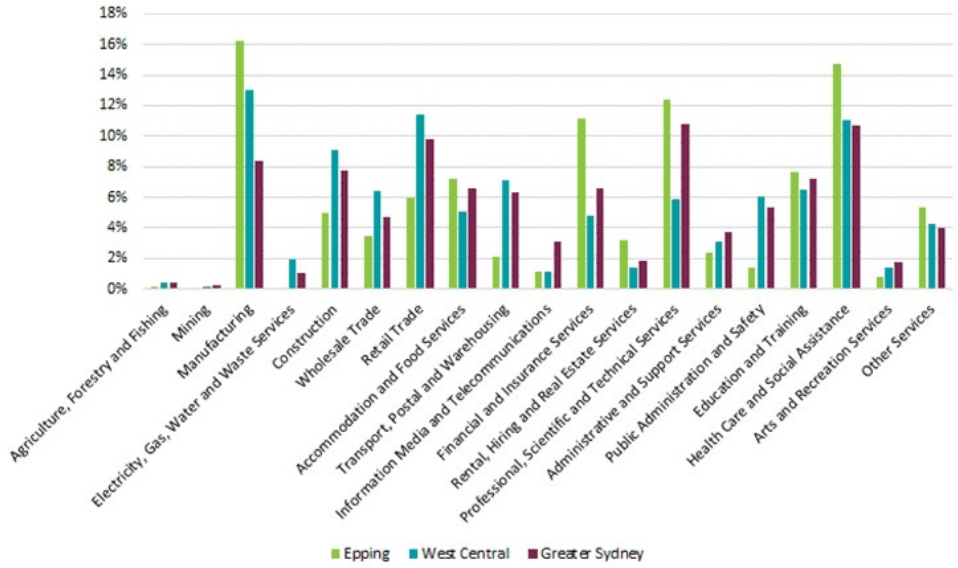
FIGURE 20. BREAKDOWN OF EMPLOYMENT BY GSC CATEGORIES ACROSS THE WEST CENTRAL DISTRICT AND GREATER SYDNEY



Source: SGS, 2017

A comparison of employment by industry with the West Central District and Greater Sydney is shown in Figure 21. Compared to these regions, the Epping town centre has a greater proportion of employment in Manufacturing, Health Care and Social Assistance, Professional, Scientific and Technical Services, Financial and Insurance Services, Rental, Hiring, and Real Estate Services, Other Services, Retail and Education and Training.

FIGURE 21. EMPLOYMENT BY INDUSTRY IN EPPING, WEST CENTRAL AND GREATER SYDNEY



Source: SGS, 2017

Further insights to the strategic clustering of industries in Epping can be gained by categorising the employment sectors by their location quotient (LQ). The LQ is given by the proportional representation of the sector in the Epping town centre versus the proportional representation of the sector in the West Central District and Greater Sydney. An LQ of greater than 1.0 signifies that Epping has a specialisation and competitive advantage in the sector, as it has a greater than average representation of economic activity in the area in question.

Table 4 below shows the LQ for the Epping town centre against the West Central District. Table 4 shows the LQ for industries defined by the ABS and the four GSC employment categories. As noted above, Epping town centre has industry specialisation in Knowledge Intensive and Health and Education employment relative to the West Central District and Greater Sydney. The Epping town centre also records an industry specialisation in Industrial employment relative to Greater Sydney.

When considering the broader range of industries defined by the ABS, industry specialisation in Epping is evident in the following when compared to both the West Central District and Greater Sydney:

- Manufacturing
- Rental, Hiring and Real Estate Services
- Financial and Insurance Services
- Health Care and Social Assistance
- Other Services
- Professional, Scientific and Technical Services
- Accommodation and Food Services

The greatest level of industry specialisation is evident in Manufacturing, Rental, Hiring and Real Estate Services and Financial and Insurance Services, where employment in these industries in the Epping town centre is double the proportion of all jobs recorded in the West Central District. Conversely, the Epping town centre has a significantly lower proportion of jobs in Retail Trade, with retail trade only making up approximately 6% of all jobs in the Epping town centre compared to 11% of jobs in the West Central District and 10% of jobs across Greater Sydney.

TABLE 4. LOCATION QUOTIENT

	Share of employment			Location Quotient	
	Epping	West Central	Greater Sydney	West Central	Greater Sydney
ABS Industry Categories					
Agriculture, Forestry and Fishing	0.08%	0.41%	0.40%	0.18	0.19
Mining	0.00%	0.09%	0.25%	0.00	0.00
Manufacturing	16.27%	13.04%	8.38%	1.25	1.94
Electricity, Gas, Water and Waste Services	0.00%	1.96%	1.04%	0.00	0.00
Construction	4.92%	9.12%	7.73%	0.54	0.64
Wholesale Trade	3.46%	6.37%	4.70%	0.54	0.74
Retail Trade	5.95%	11.39%	9.76%	0.52	0.61
Accommodation and Food Services	7.17%	5.02%	6.56%	1.43	1.09
Transport, Postal and Warehousing	2.10%	7.14%	6.30%	0.29	0.33
Information Media and Telecommunications	1.13%	1.09%	3.08%	1.04	0.37
Financial and Insurance Services	11.11%	4.81%	6.54%	2.31	1.70
Rental, Hiring and Real Estate Services	3.19%	1.38%	1.80%	2.30	1.77
Professional, Scientific and Technical Services	12.36%	5.86%	10.74%	2.11	1.15
Administrative and Support Services	2.37%	3.09%	3.74%	0.77	0.63
Public Administration and Safety	1.41%	6.02%	5.29%	0.23	0.27
Education and Training	7.68%	6.51%	7.22%	1.18	1.06
Health Care and Social Assistance	14.75%	11.09%	10.70%	1.33	1.38
Arts and Recreation Services	0.72%	1.36%	1.79%	0.53	0.40
Other Services	5.33%	4.25%	3.98%	1.25	1.34
GSC Industry Categories					
Knowledge Intensive	31.42%	22.24%	31.19%	1.41	1.01
Population Serving	22.91%	31.14%	29.82%	0.74	0.77
Industrial	24.63%	29.03%	21.07%	0.85	1.17
Health and Education	21.04%	17.59%	17.92%	1.20	1.17

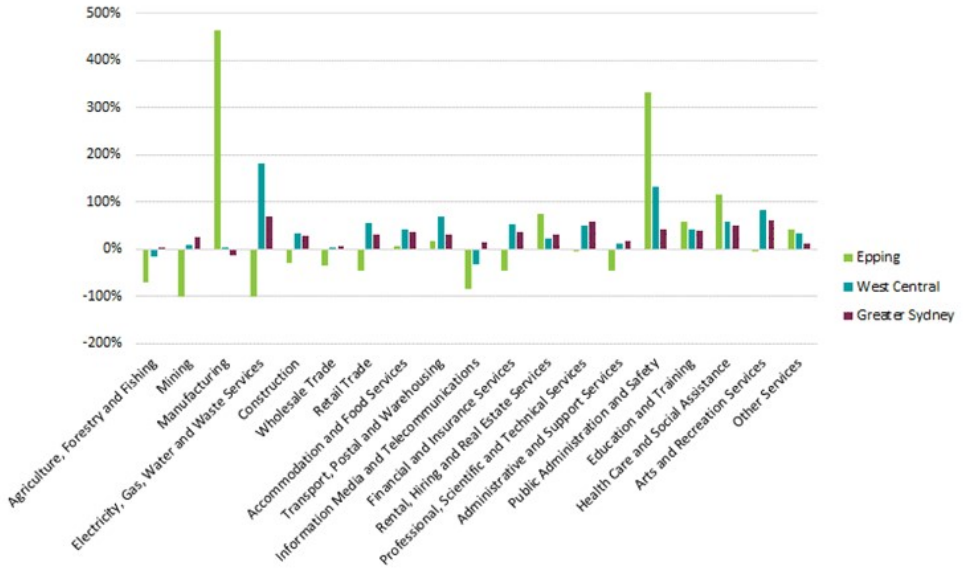
Source: SGS, 2017

Growth in employment by industry between 1996 and 2011 is shown in Figure 22. Over this period, the greatest industry growth for Epping has been seen in Manufacturing, Public Administration and Safety and Health Care and Social Assistance. Over this fifteen year period, these industries at least doubled employment numbers in the Epping town centre and have grown more rapidly in the centre than in either the West Central District or Greater Sydney. Employment growth outpacing the West Central District and Greater Sydney was also evident in Rental, Hiring and Real Estate Services and Other Services.

Declines in employment have been observed in the following industries in the Epping town centre:
- Electricity, Gas Water and Waste Services
- Mining
- Information media and Telecommunications
- Agriculture, Forestry and Fishing
- Administrative and Support Services
- Financial and Insurance Services
- Retail Trade
- Wholesale Trade

- Construction
- Arts and Recreation
- Professional, Scientific and Technical Services.

FIGURE 22. CHANGE IN EMPLOYMENT, 1996-2011

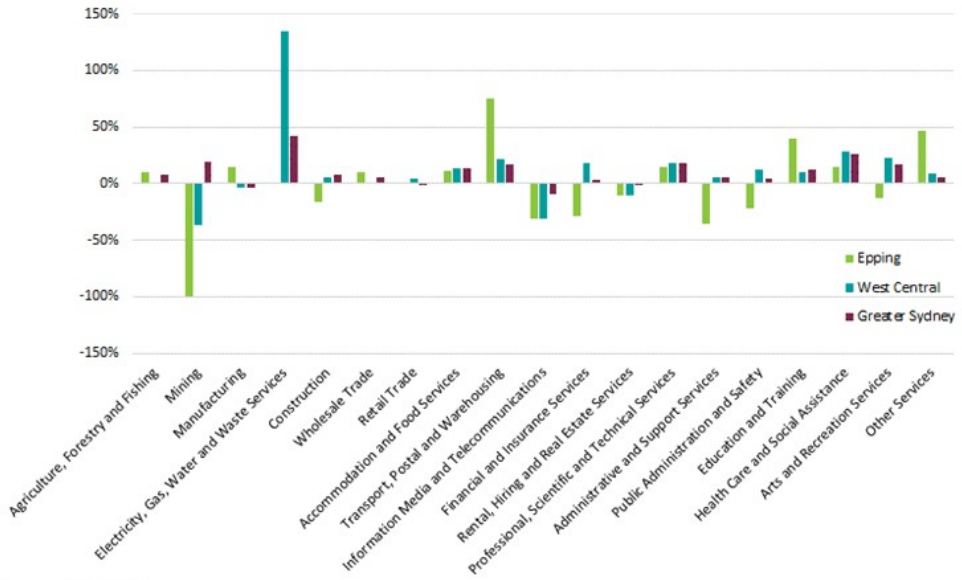


Source: SGS, 2017

In the five years between 2006 and 2011, the Epping town centre gained approximately 1,000 jobs. Figure 23 illustrates the trends in employment by industry in Epping against the West Central District and Greater Sydney over this period. In all industries where Epping experienced jobs growth, increases are also evident in the West Central District and Greater Sydney, except for manufacturing which grew by 14.2% despite an overall decrease in employment in the district and Greater Sydney. Jobs in the Manufacturing industry in the Epping town centre have located in office floorspace and likely incorporate administrative and business services jobs to support industrial jobs. This is different to the majority of Manufacturing jobs across Greater Sydney, which are accommodated in industrial precincts and have declined as Australia moves towards a service economy.

Conversely, the decline in Financial and Insurance Services employment in the Epping town centre was not evident in the district or Greater Sydney, where employment in this industry grew. A decline in employment in Information Media and Telecommunications and Rental, Hiring and Real Estate Services industries was evident across the Epping town centre, West Central District and Greater Sydney.

FIGURE 23. CHANGE IN EMPLOYMENT, 2006-2011



Source: SGS, 2017

3.3 Recent trends and employment forecasts

There have been some significant changes in the commercial landscape of Epping since the 2011 Census. The declaration of Epping as Priority Precinct has seen a significant uplift in development potential in and around the town centre. Some significant employers have relocated out of the Epping town centre as other employment centres have grown.

Analysis of commercial floorplates in 2011 and in 2017 indicates that approximate 25,000 square metres of commercial floorspace has been demolished in Epping, leaving approximately 30,000 square metres of office floorspace. Simultaneously, there are several properties which contain stand alone office developments that have high vacancies and are subject to development applications or have been rezoned for high density residential uses. Real estate analysis prepared by CBRE forecasts Epping to lose 17,900 square metres of commercial floorspace to residential development from 2015 to 2020.

The loss of these employers is significant as these businesses are in industries identified as the greatest employers and industry specialisations of the Epping town centre.

Employment forecasts prepared by Transport Performance and Analytics do not consider the recent changes in office floorspace in Epping and are largely based on past trends recorded in the Census. The 2016 Census, which is not yet available for data analysis, is likely to pick up on these trends observed in consultation findings.

These trends are discussed further in the following Chapter.

3.4 Summary

Population in the Epping town centre is forecast to grow significantly in line with the forecast dwelling growth under the Priority Precinct planning controls. The population of the Epping town centre is forecast to remain relatively young, with significant proportion of the population aged in their 20s and

30s. These populations generally include university students and young professionals, with higher than average incomes.

Epping has a relatively even spread across the GSC's 4 job classification categories. This split of jobs indicates that Epping is an accessible location, and has attracted jobs in industries that do not rely on local populations, such as knowledge intensive jobs in professional services. Epping has a lower proportion of population serving industries than the West Central District and Greater Sydney.

Employment in retail in particular is relatively low in the Epping town centre, reflecting the scale of retail development in the centre. The relatively low proportion of retail floorspace also indicates that Epping does not meet one of the definitions of a District Centre prepared by the Greater Sydney Commission.

Recent developments in the Epping town centre have seen a significant reduction in office floorspace, with a likely corresponding reduction in employment in knowledge intensive industries, which is not reflected in the most recent employment forecasts for Greater Sydney. Given this the TPA employment forecasts have not been presented or used as a basis for projecting employment floorspace in this work.

4 MARKET TRENDS AND DRIVERS

This Chapter provides an overview of local and macroeconomic trends impacting on office, retail and other non-residential businesses and development. The information presented in this Chapter has been based on published market research and on consultation. The organisations consulted with include:

- City of Parramatta Council,
- Epping Chamber of Commerce,
- Local real estate agents, and
- Land owners within the B2 zone.

4.1 Retail market trends

While spaces for office uses in the Epping town centre are diminishing as a result of residential conversions, retail floorspace is generally being maintained at the ground floor level as part of new developments. It is expected that as the population in Epping grows, there will be increased demand for retail and other non-residential, population related uses in the town centre. Consultation with real estate agents reflects this too, with the proximity of Epping town centre to the railway station seen as a factor that is likely to drive this demand, along with the growing population.

Current market environment

Previous analysis of the commercial market in Epping has identified that retail premises are tightly held because of the desirability and relative stability of the market, and that there is a strong focus on retail servicing the resident and employee populations.[4]

Retail uses are largely located along Rawson Street, Oxford Street, Beecroft Road, Bridge Street and Langston Place, with the vast majority of retail space on the western side of the railway line, including the existing supermarket and many specialty stores. Previous analysis has identified that a significant portion of potential retail sales on the eastern side of the precinct is lost to nearby centres, due to a relative lack of services compared to the western side, and existing issues with pedestrian and vehicular connectivity between the two. In 2011, the supermarket made up 3,800 square metres of the town centre's retail space, with another 8,531 square metres in the form of specialty stores.[5] Advertised rents for retail floorspace at the time of writing are between $100 and $362 per square metre.

Consultation with existing land owners in the B2 Local Centre zone suggests that there is a perceived lack of variety in the current retail offering in Epping, and that the physical appearance of retail spaces and amenities could be updated and improved. Traffic and parking congestion have also been identified as weaknesses for the town centre.

The Epping town centre currently has a relatively high vacancy rate along retail shopfronts, particularly on the eastern side of the centre. However, this is considered to be a short term trend. These vacant sites generally form part of development applications for new mixed use development incorporating retail floorspace on the ground floor. While short term retail trade may be impacted as existing office

[4] HillPDA, 2014, *Epping town centre – Feasibility Study*, prepared for Parramatta Council, May 2014 (Commercial in Confidence).

[5] JBA, 2011, *Epping town centre Study Volume 1*, prepared for Hornsby Shire Council, Parramatta City Council and Department of Planning, April 2011.

development is demolished, the injection of new residents in the centre is likely to inject spending into the Epping town centre.

Epping sits within a wider retail system, with significant retail offerings within 3 kilometres of the centre at Carlingford, Eastwood and Macquarie Park. The prevalence of enclosed shopping centres at Carlingford and Macquarie Park in particular are likely to impact on local trade in Epping, drawing spending for higher order retailing to these centres.

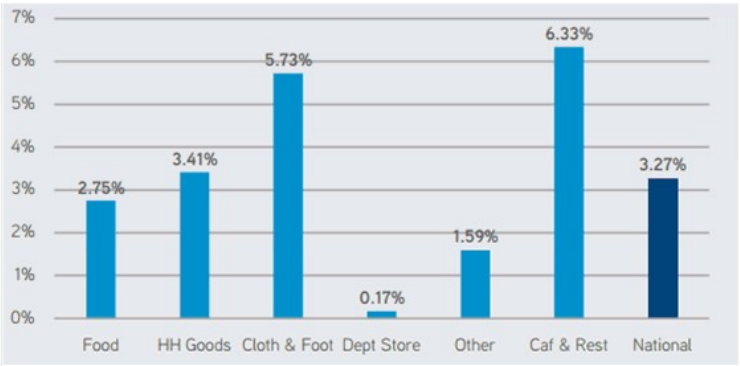
Emerging trends in the retail market

Changes in consumer spending

In the years following the Global Financial Crisis (GFC) in 2008, the proportion of household savings to income in Australia has remained high, and this is generally associated with a reduction in the amount of household income that is spent on retail. However, consumers are spending more in service and experience based areas such as travel, and in food retailing and non-discretionary categories of spending, which have continued to grow faster than discretionary retail categories.[6]

As Figure 24 below illustrates, growth has occurred in a number of retail sectors in more recent times, with the strongest growth between 2015 and 2016 in spending at cafés and restaurants and on clothing and footwear. The lowest growth was seen in department store sales.

FIGURE 24. RETAIL SALES BY CATEGORY (YEAR-ON-YEAR CHANGE, 2015-2016)



Source: Colliers International, 2016.[7]

Recent growth in consumer spending in Australia has been attributed to rising property prices, with increased household wealth and low interest rates driving domestic spending, and the decline in the strength of the Australian dollar encouraging international spending.

Online retailing

The flexibility and convenience of shopping online are often quoted as the reasons why people will choose it over physical stores, with the perception that customers are able to find better offers online also an important factor. The growth of online retailing has had an impact on the retail sector in Australia, and accounts for around 7% of what is spent in physical stores, however, growth in online sales has appeared to slow in recent times, as illustrated in Figure 25.

[6] Knight Frank, 2015, 'Retail demand trended upward, in 2014, what's in store for 2015,' Research briefing, Q1 2015 Issue, https://kfcontent.blob.core.windows.net/research/821/documents/en/resinsight150331c-2892.pdf

[7] Colliers International, 2016, 'Retail Second Half 2016,' Research and forecast report, http://www.colliers.com.au/find_research/retail/

FIGURE 25. GROWTH IN ONLINE RETAIL (% MONTH-ON-MONTH)

Source: NAB, 2017.[8]

The proliferation on online shopping has implications for the provision of retail space in centres such as Epping. Online retailing has a number of advantages for businesses and consumers, including wider product offerings, opportunities for innovation, strong review and referral networks via social media, and benefits from time efficiencies. However, traditional 'bricks and mortar' stores have a number of advantages as well, including being able to offer personal service, customers being able to see and test products in person, and the benefits of shopping as a social experience.

Many retailers consequently have both physical and online stores. This can help to maximise their potential revenue streams but also buffer against macroeconomic trends which tend to affect one platform more than the other, such as changes in the value of the Australian dollar which can impact on international online sales in particular.

Retail as an experience

In recent times, there has been a growing trend towards leisure-based retailing, which is more about providing 'experiences' for consumers than just products. This includes retailers focusing on customer service and providing a quality range of products to differentiate themselves from competitors. In this area, physical stores have an advantage over online retail, including in food and beverage retailers, as their products and the experience of visiting a store is not available online. The presence of international retailers in both shopping centres and on high streets is reflective of this trend as well, along with the rise in the number of cafés and options for outdoor dining in and around retail centres.

The growth of shopping as an experience is also reflected in the emergence of 'slow retailing,' in contrast to 'fast retailing' which is based on quick turnover of inexpensive, simple and standard retail products for a mass audience. Slow retailing provides more tailored products, where retailers aim to distinguish themselves from competitors through the individuality and quality of their merchandise, targeting niche markets, and engaging with the customer at a more personal level. These types of retailers may also focus on providing locally produced stock and providing a higher level of service.

Rise of regional shopping centres

A number of suburban centres in Australia's major cities have emerged as preferred locations for both retailers and customers, including the Macquarie Centre. This trend of decentralisation away from CBDs has been driven by several factors, including growing affluent suburban populations, corporate chains with fewer ties to locality and the ability to move to areas with demonstrated demand, and changes in sales tactics that require larger stores and parking availability.

[8] NAB, 2017, 'NAB Online Retail Sales Index,' Monthly Report – January 2017, http://business.nab.com.au/wp-content/uploads/2017/03/NORSI-January-2017.pdf

The growth of these types of centres is expected to continue. Regional shopping centres are also typically marketing themselves as destinations for leisure in order to attract customers. This may have implications for the retail market in Epping, particularly as it is in close proximity to the Macquarie Centre, which is also planning an expansion on its site to include residential and entertainment uses in addition to its existing retail functions.[9]

Bulky goods retailing

The bulky goods retailing sector has been performing strongly in recent years, driven by growth in housing construction and demand for household goods, though the rate of growth in households goods retailing in the year to November 2016 (3.5%) was much lower than the previous year (6.2%).[10]

Growth in the sector is expected to continue with price growth in the housing market and low interest rates. Consumer desires for tactile shopping experiences are also expected to continue to contribute to demand for bulky goods retailing. However, the sector generally requires buildings with larger floor areas than other types of retail or commercial uses.

Change in inner suburban supermarkets

Historically, the grocery market in Australia has been dominated by Coles and Woolworths, accounting for more than 70% of the market in 2015.[11] However in the last 10 years major competition from IGA and Aldi has seen their dominance reduce.

Many shopping centres and high street shopping strips are still anchored by at least one of these stores. However, there changing consumer preferences are driving demand for different forms of grocery retailing. This includes a small but growing level of demand for organic foods, in line with growing awareness around how food is produced and its environmental impact. The growth in the number of people adhering to vegetarian, vegan and other diets are also likely driving demand for more specialised food offerings. The popularity of farmers' markets in Sydney and elsewhere also illustrates the rise in demand for this form of retailing.

Deregulation of trading hours

Relaxation of permitted opening hours for retail stores over recent decades has shifted the way that people tend to shop. Demand has drifted to the weekends, and smaller, neighbourhood level stores appear to have become less important. The shift has been particularly noticeable in longer opening hours for supermarkets.

Longer retailing hours can be important to particular forms of retail that can support night-time economies, including restaurants and movie theatres.[12] Deregulated trading hours also provide benefits to customers in added convenience, greater competition between retailers, and potentially allow for greater employment in the retail sector.

4.2 Office market trends and drivers

Current market environment

Consultation undertaken with commercial real estate agents working in the Epping area suggests that there are a number of factors that attract tenants to Epping. These include the relatively lower cost of commercial office space, particularly when compared to other markets like Macquarie Park, and features such as the lack of parking levies in the area. Epping's transport accessibility, both for residents living on

[9] See Macquarie Centre, 2017, 'Stage 1 concept development application,' https://www.macquariecentre.com.au/development

[10] CBRE, 2017, 'Australian Retail, Q4 2016 – Rent growth moderating,' Marketview research report.

[11] Roy Morgan Research, 2051, 'The ALDI effect: Australia's changing supermarket scene,' 22 June 2015, http://www.roymorgan.com/findings/6297-aldi-effect-australias-changing-supermarket-scene-201506220132

[12] JLL, 2013, 'The evolution of Brisbane Retailing', Research report, July 2013, http://www.jll.com.au/australia/en-au/Research/JLL-AU-Advance-The-Evolution-Of-Brisbane-Retailing-July2013.pdf

the north shore of Sydney and its strong connections to major employment and commercial centres, is also a significant drawcard for agents, and for the existing commercial land owners consulted.

However, there is currently very little available commercial space in the town centre, for either rent or sale. One real estate agent suggested that as little as 1,500 square metres was currently available for rent across the office market. As such, the vacancy rate in Epping is low, and available space is limited to only of a few sites across the town centre. The lack of available commercial space was confirmed in consultation with the Epping Chamber of Commerce and current land owners in the B2 zone. The Chamber in particular identified that a lack of available spaces, coupled with unfavourable lease terms, is causing many businesses to leave Epping, and that business confidence in Epping is generally poor.

Advertised rents for office space in Epping currently range between $228 per square metre up to $587 per square metre.[13] The majority of spaces on the market currently are less than 500 square metres, with larger spaces primarily advertised as short term leases only. Rental prices for commercial stock have also largely been static for 12 months. The stock that is available in the town centre is also only rated as low B-grade quality

Analysis of developments in the pipeline for Epping also shows that there is very little in the way of stand-alone commercial stock expected to be delivered in the centre in the near future, with most proposed commercial or retail floorspace to be included as part of residential developments.[14] This ongoing lack of pipeline supply has been raised by the Chamber of Commerce as a major issue of concern.

There are several factors which are contributing to the low current office vacancy rate in the town centre, including increased competition from higher-order nearby commercial centres and the conversion of existing office blocks to residential uses.

Competition from residential uses

Commercial uses in the Epping town centre are being significantly impacted on by growth in the residential market, and particularly by the withdrawal of office market stock for conversion to residential uses. In recent years, the property industry has forecast that the demand for residential development in the Sydney metropolitan region would cause withdrawals of office stock from non-CBD locations, with many office buildings to be sold to residential developers.[15] Epping was identified as an area where there would likely be a concentration and continuation of office floorspace withdrawals, along with that occurring in centres such as Burwood and Hurstville, as these smaller suburban markets are expected to become largely residential hubs.

The rezoning of centres like Epping to encourage the development of more housing has meant that the highest and best use of many sites is now residential. This trend for residential conversions has also been observed across Sydney's suburban office markets, with the withdrawal of office space outpacing new supply.[16]

Some reports estimated that there would be a 34% (or close to 18,000 square metres) decline in office space in Epping in the three years following the zoning changes.[17] It was also predicted that this would cause larger tenants to move out of Epping and other centres such as North Sydney and St Leonards,

[13] Prices sourced from http://www.commercialpropertyguide.com.au, accessed March 2017.

[14] Based on Cordell Connect data, http://www.cordellconnect.com.au/

[15] See Pryor, 2015, 'Residential Conversion Plays: What do they mean for Sydney suburban office markets?' CBRE Viewpoint research report, May 2015; Raine & Horne Commercial, 2016, 'Office Market Stock Levels,' 23 February 2016, http://www.rhcop.com.au/property-news/2016/february/23/office-market-stock-levels.aspx

[16] See Knight Frank, 2016, 'Sydney Suburban Office Market Overview,' February 2016.

[17] See Pryor, 2015.

which have also seen significant reductions in commercial floorspace as the number of residential conversions increased, and as the supply of new office buildings in the pipeline has been limited.[18]

Consultation with real estate agents has identified that since the zoning changes implemented in the town centre and the designation of Epping as a Priority Precinct, the pace of residential conversions and demand for housing in the area has grown dramatically. A substantial number of sites that were previously office buildings have been converted, which has left only a small number of buildings with available office space, contributing to the low vacancy rate. There is also evidence that local businesses have been and are currently unable to stay in the Epping area after their buildings have been converted for residential uses, and this has been identified as an issue by current land owners in the B2 zone as well.

Industry research has suggested that buyers for commercial property are primarily interested in suburban markets for value-add and redevelopment opportunities. This was reflected in consultation with agents, where sales activity and prices have been generally stagnant in Epping, except for commercial properties with redevelopment potential for conversion to residential uses.

Consultation with existing land owners (including both those who have current plans to redevelop and those that do not) suggests that most would like to see a mix of commercial, retail and residential uses on their sites in future. Some indicated that they would consider providing retail shops and office space in addition to spaces at the ground floor level, to meet the demand for such uses and support the commercial and retail role of the Centre, but that this would be limited by site and zoning constraints and the overall preference is to include residential given current property market conditions.

There is also some evidence that landlords of commercial sites in Epping are only offering lease terms of around two to three years. This would ensure that they would have the opportunity to convert their properties to residential uses and take advantage of the current residential property market. The Epping Chamber of Commerce has identified that businesses are also leaving Epping because they are unable to obtain leases without demolition clauses.

Competition from nearby commercial centres

As well as a withdrawal of office stock from the market, competition from nearby commercial centres is also impacting on the Epping town centre. The most significant competitor to Epping is Macquarie Park, and as it expands and develops greater amenity it is expected to continue to attract commercial tenants that may have been displaced by residential conversions.

Industry research has indicated that many larger companies have already relocated to Macquarie Park from former commercial buildings in Epping. Among the businesses which are planning to leave Epping or have already relocated according the Epping Chamber of Commerce are:

- The Westpac Card and Call Centre for Australia,
- Unilever Australia Research and Corporate Headquarters,
- Baptist Community Services,
- Hasbro,
- NEC Australia,
- Craig & Rhodes Surveyors,
- Chill IT, and
- Northern District Times Newspaper.

Larger centres like Macquarie Park, Parramatta, and the Sydney CBD are expected to be more popular than suburban areas such as Epping, where there is less available and upcoming supply, less organic growth, and fewer large commercial floorplates available. Tenants are also unlikely to be attracted to smaller and cheaper suburban markets and away from these centres, as cost is only one element of

[18] See CBRE, 2017, 'Australia Office, Q4 2016 – Office cycle reaching bottom, Limited new supply in 2017,' CBRE Marketview research report.

decisions made about where to locate, with transport accessibility, talent availability and amenity also important.

The withdrawal of existing office uses from Epping was expected to impact on demand from tenants who require larger floorplates with a lack of oncoming supply in the centre and proximity to the campus style business park in Macquarie Park. This was confirmed in consultation with local real estate agents, who indicated that very few large office spaces are currently available in Epping, and that numerous tenants had relocated to Macquarie Park in recent years. This trend may potentially be slowed with the temporary closure of the Epping to Chatswood rail line as it is converted to the Sydney Metro network but is unlikely to be stopped.

Consultation with real estate agents also identified that tenants looking for space within the Epping town centre generally need floorspace of less than 200 square metres. There is currently very little interest from bigger companies in Epping, likely because they understand that there is not much available in the way of large and suitable spaces in the town centre but also because of trends to centralise operations and consolidate in larger centres with a fuller range of complementary businesses and where agglomeration economies are available. The lack of available space is also a concern for business groups in Epping, whose membership base has declined as tenants have relocated out of the town centre.

As well as Macquarie Park, there is indirect competition in the commercial market coming from some of the smaller nearby markets, such as Chatswood, Hornsby and Pymble, and previously at Pennant Hills, though the impact of competition from these centres has been far smaller than the impact from Macquarie Park. The Chamber of Commerce indicated that Rhodes is another competing location, with at least one long-standing Epping business relocating there after they could not obtain a suitable space and lease terms in Epping. In contrast, very few businesses are relocating to Epping from other centres.

Emerging trends in the office market

Industry changes

As identified above, the reductions in available commercial floorspace is changing the types of businesses that are located in Epping. Consultation with real estate agents suggests that the office tenants that have remained in or are looking for space in the Epping town centre are largely small business services and advisory firms, typically with around six to eight employees.

Members of the Epping Chamber of Commerce have historically included a range of businesses from different industries, and include healthcare practitioners, real estate agents, lawyers, accountants, IT consultants, surveyors, restaurants, and up to medium sized corporations. Epping's employment focus appears to be shifting away from these knowledge intensive jobs to population serving industries, including real estate agents, restaurants, and tutoring colleges, which were reported to have increased in recent years. As identified above, the withdrawal of suitable stock coupled with competition from Macquarie Park has meant that there are no large corporate tenants in the town centre.

Flow on effects from other centres and infrastructure investment

As the Parramatta CBD grows and commercial development there increases, it may be that smaller, population servicing businesses exit that market. Epping is a logical potential location for these types of businesses to re-establish themselves in. Recent analysis of the commercial office market has suggested increased demand for office floorspace in Sydney's north-west as the Sydney Metro North West is completed. Demand is forecast to increase for sub-1,000 square metre office spaces, however most of this forecast demand is envisaged along the western end of the Sydney Metro rather than in Epping, especially the Norwest Business Park.[19]

Macroeconomic trends

[19] Knight Frank 'Sydney Suburban Office Market Overview March 2017', March 2017 https://kfcontent.blob.core.windows.net/research/308/documents/en/sydsub1703-4568.pdf

There are also broader trends and changes occurring in office markets that may affect the way that commercial spaces in Epping are provided and used in future. These include changes in the Australian economy, with the shift towards service-oriented and professional industries; the decline in manufacturing and other traditional industries; the implications of an ageing population and expected growth in health service industries; and the importance of location and transport accessibility to businesses, particularly those in knowledge-intensive industries.

Co-working spaces

Another important trend that impacts on the way that office space is provided and used is the growing use of shared co-working spaces. This trend has been observed worldwide, with the number of co-working locations expected to increase to 12,700 across the globe in 2017. Technology advancements, changing workforce demographics, and shifts in major industries are driving the growth of co-working in Australia, with the number of co-working spaces in Sydney growing by 41% per year in the last 10 years.[20]

The main advantages of the co-working model over leasing traditional office space include that companies have lower costs associated with workspaces, and can benefit from collaborative working environments with other firms and industries.[21] The flexibility that co-working offers firms is also seen as an advantage, with spaces often available on a weekly or monthly basis, and the model has become particularly popular for start-up businesses.

Locating co-working spaces in suburban commuter hubs has also become popular, with the NSW Government supporting Smart Work Hubs at Rouse Hill, Oran Park, and Penrith in Sydney's west. These Hubs provide a range of options for hiring space, from daily passes to monthly arrangements with different amenities included in the pricing.[22] A number of privately operated co-working spaces have also been established in the Parramatta CBD. The growing trend for these more flexible forms of rental of commercial space could have implications for how much office space is required in the Epping town centre in future.

4.3 Other non-residential uses trends and drivers

The expected growth in the population of the Epping town centre is likely to drive a need for different non-residential uses in addition to more housing. This will include facilities such as gyms, child care centres, health centres and educational facilities, as well as civic services. As identified above, the vast majority of new development expected in Epping will be for residential units, though some residential and mixed use developments may include facilities such as gyms or child care centres as part of their commercial or retail space.

Consultation with real estate agents has suggested that with the increase in residential development and the population, there has been more inquiry and demand from ancillary type businesses for space in the Epping town centre. This has been particularly noticeable for child care centres and other educational uses, and for gyms and cafés. The Chamber of Commerce has also noted that there have been increases in the number of tutoring colleges for school children in the area. There hasn't been significant demand from restaurant owners looking for space as yet, given limited current demand, but this is expected to change as the population grows.

[20] Knight Frank, 2016, 'Sydney Coworking insight,' October 2016, https://kfcontent.blob.core.windows.net/research/1161/documents/en/resinsight161024-4197.pdf

[21] See PWC, 2017, 'Emerging Trends in Real Estate,' Asia Pacific 2017, https://www.pwc.com.au/publications/assets/emerging-trends-real-estate-2017.pdf

[22] See Space&Co., 2017, http://spaceandco.com.au/office-spaces/sydney/rouse-hill-town-centre/; Oran Park Town, 2017, http://www.oranparksmartworkhub.com.au/memberships; WOTSO Workspace, 2017, http://www.wotsoworkspace.com.au/penrith/

Analysis of developments in the pipeline for nearby LGAs Ryde and The Hills also shows a large number of developments that have been proposed or approved that are stand-alone child care centres or gyms, or included as part of residential development.[23]

These types of non-residential uses are usually accommodated in retail spaces rather than in space that would otherwise be used for offices. As such, consultation suggested that there hasn't been a noticeable impact on the office market in Epping from increased demand for these facilities so far, however increased demand for such services will likely increase competition for retail floorspace in future. Current land owners in the B2 Local Centre zone saw the provision of these types of spaces and services as less important to the role of the Epping town centre compared to its function as a place for day-to-day retail needs, housing, and office space.

Investment in child care centres is becoming more popular in the Sydney property sector, particularly in areas with growing populations.[24] The NSW Government has also recently moved to respond to increased demand and shortages of child care centre spaces by streamlining some of the rules around the development application process for child care centres,[25] which may further increase demand for child care sites.

The development of Epping in future will need to consider the balance between the provision of these types of population-serving uses with residential and commercial development, and will be particularly important if there is a downturn in the housing market. There remains the risk that the current high level of demand for housing development in areas such as Epping will limit the space that is available for these types of community-serving uses that are required for centres to function effectively over time.[26]

4.4 Epping community workshop

A community workshop was held as part of the process of preparing this report and the wider Epping Planning Review. The workshop was held on Monday 22 May and was facilitated by Straight Talk to understand the needs and desires for land uses requiring commercial floorspace of the Epping community, including residents and business owners, now and into the future. Participants were asked about how they currently use the Epping town centre, what they do not use the Epping town centre for, and the future role of Epping as a hub for employment.

The findings of the workshop were as follows:

- Epping is currently viewed as a town centre by the local community, providing for day to day needs for transport, retail and services
- Residents and workers in the Epping town centre use a wide variety of services in the centre, including community services such as the library, medical, restaurants, design and engineering services, education and public transport
- The retail offering currently in Epping does not provide a number of convenience retail options (e.g. there is currently no butcher, greengrocer, bakery etc.)
- Residents seek retail and other services out of the Epping town centre for two main reasons:
  - There is simply no local option in the Epping town centre
  - The quality of offering is better in other centres
- Participants also noted a lack a professional job opportunities in the Epping town centre.

[23] Based on Cordell Connect data, http://www.cordellconnect.com.au/

[24] See Cummins, 2016, 'Childcare properties find growing favour with investors,' *Sydney Morning Herald*, 13 May 2016, http://www.smh.com.au/business/property/child-care-properties-are-back-in-favour-20160512-gotrkr.html

[25] See NSW Department of Planning and Environment, 2016, 'More quality child care where it is needed,' Ministerial media release, 3 November 2016, http://www.planning.nsw.gov.au/News/2016/More-quality-child-care-where-it-is-needed

[26] Griffiths & Clouston, 2015, 'Successful centres: protecting Sydney's long-term productivity,' *New Planner*, September 2015, http://www.hillpda.com.au/wp-content/uploads/2015/09/New-Planner_Sept-2015_Griffiths-and-Clouston.pdf

- There was little resistance to increasing the amount of space available for new businesses and offices spaces. Many participants wanted Epping to grow and wanted to develop a new heart for the town centre.
- Flexible floorspace configurations for office and retail uses were suggested to ensure the Epping town centre can accommodate businesses as they grow and develop into the future.
- There is a desire to maintain the strong community feel of the Epping while having access to essential services and facilities of a town centre

4.5 Role and opportunities for the Epping town centre

Based on the consultation undertaken with the organisations identified above, analysis of market trends and Epping town centre's economic profile, and the current retail and office environment, there are a number of key issues and opportunities for the Epping town centre.

Epping's retail offering largely services the local catchment and provides a day-to-day convenience offering. Weaknesses of the retail offering of Epping raised through stakeholder consultation include a lack of variety and shabby appearance of existing retail stock. The redevelopment of existing retail sites provides the potential for tis floorspace, where appropriate, to be replaced with newer shopfronts and may potentially change the variety of retail on offer as the population of the Epping town centre increases.

Epping's proximity to largely enclosed shopping centres, including the significant regional Macquarie Centre, limit the potential of the Epping town centre to act as a higher order retail centre in the current market. The potential role for Epping in the future is likely to involve high quality service centre for local daily needs and leisure opportunities through hospitality uses such as dining.

As identified above, a key issue for the Centre is the apparent market failure occurring with regards to the provision of office space in particular. There is currently little available space in the town centre, as a result of both competition from other commercial centres and increased residential redevelopment, and what is available in the Epping market is not meeting current demand.

In addition to this, the spaces on offer are largely smaller spaces, which do not cater to the needs of larger businesses and organisations. As a result, many of the larger tenants who have previously located in Epping have moved to other commercial centres where both larger floorplates and newer buildings are available. It is unlikely that this situation will be reversed in Epping, given the locational advantages and size of some of the competing centres nearby to Epping, particularly in Macquarie Park and the Parramatta CBD.

However, there are several trends and drivers that Epping is likely to continue to benefit from which could be capitalised on in the future development of the town centre. Epping is already a popular centre, particularly for smaller businesses. The town centre also has the benefit of excellent public transport access and connectivity to the Sydney CBD and other major centres, which is valuable to both residents and people who work in the centre.

Epping's population is forecast to grow substantially as a result of the increased residential development in the area. This is beneficial in terms of providing a larger consumer catchment for businesses in the town centre to draw on, as well as in providing a larger potential workforce. As identified in previous chapters, the population of Epping is forecast to remain relatively young, and have a high level of labour force participation.

Epping also has a higher than average concentration of jobs in knowledge intensive industries and jobs in health and education compared to both the West Central District and Sydney overall, as shown in Table 4. There may be opportunities to capitalise on this concentration in the types of spaces included in future development, together with the existing transport accessibility of the Centre, which is known to be particularly important for knowledge-intensive employment. Epping may also be able to cater to the

expected demand from smaller-sized businesses exiting the Parramatta CBD market, as that centre continues to expand and increasingly caters to larger businesses as Sydney's second CBD.

While there is increasing pressure for residential development in the centre, the current land owners consulted with generally recognise the importance of retaining and providing for both office and retail uses, as these will be important to the ongoing viability and functionality of the centre along with increased residential development. Provision for other non-residential uses is seen as less important, though demand for services such as gyms and child care centres, and other population based services are likely to emerge as the population grows.

Given Epping's close proximity to other strategic centres at the metropolitan level and the issues identified above, the role of Epping could therefore be seen as a sub-district centre, which meets the needs of a local residential population as well as providing higher-order services and commercial space for small to medium sized businesses.

5 RETAIL DEMAND ASSESSMENT

This Chapter assesses the forecast future demand for retail floorspace in the Epping town centre. This analysis considers the Epping town centre as part of a wider retail system including Carlingford and Eastwood retail centres.

5.1 Existing and future retail supply

The local retail market

Epping centre is located within a local retail market SGS has defined which comprises an estimated 89,300 residents in 2016. The local retail market comprises the suburbs of Epping, Marsfield, Eastwood, Denistone, Denistone East, Dundas Valley, Telopea and Carlingford. The definition of this local market is based on a spatial analysis of likely customer behaviour and known trade patterns from businesses based within the market. Behaviour and expenditure patterns have been estimated to reflect logical travel patterns. This has been informed by a review of the geographic features which may obstruct travel and limit the number of retail centres which can be conveniently accessed. Shoppers will be prepared to travel further and longer for specialised, higher order centres where travel is offset by convenience of the wide variety of goods available in one location. This behaviour is serviced by sub-regional and regional centres, and the local market definition has reflected the retail centre hierarchy in the district.

The defined local market is geographically constrained to the north by the limited north-south permeability of the M2 Motorway. Residents in suburbs beyond the local market have been assessed as within the primary sphere of influence of other key retail centres, particularly in Macquarie Park, North Rocks and strong retail centres in Ryde.

Within the local market the key retail centres are the neighbourhood-scale activity centres at Epping and Eastwood and the sub-regional centre and main street retail in Carlingford.

Each of these centres also serves an additional component of trade drawn from beyond this market, such as workers who reside beyond the immediate district, as well as other incidental and transient trade. As trade from these customers is more infrequent and incidental a geographic distinction has been drawn between these shoppers and residents living in the local market. Further analysis of these patterns is outlined in Primary Trade Area definitions in the Demand section.

Similarly, not all retail expenditure from residents living in the local market is captured by these centres. Expenditure from residents which is spent outside this local market is dispersed across a wide geographic area. A network-wide review of spending patterns is beyond the scope of this study, but logical assumptions can be made.

Regional centres at Macquarie Park, Top Ryde and Castle Hill serve higher order retail needs of residents in the local market, as these are the nearest sources of department stores, discount department stores (other than in Carlingford Court) and a variety of specialised mini-majors.

Epping

The retail centre is located along Beecroft Road and Oxford Street, with some additional provision along Carlingford Road and Langston Place. The retail centre is bisected by the rail line with the only at grade

connection along Epping Road. The largest retail tenant is a freestanding Coles supermarket of approximately 3,800sq.m. Gross Leasable Area (GLA). Epping town centre also contains significant hospitality uses, including the Epping Club and the Epping Hotel.

The Epping town centre has a mix of specialty hospitality businesses and local services. Clothing retailing is limited to a handful of small retailers, and the centre lacks large format retailers other than Coles. The estimated retail floorspace of the Epping town centre at 2017 is shown in Table 5.

TABLE 5. ESTIMATED FLOORSPACE BY RETAIL TYPE – EPPING

	Supermarkets/ Convenience stores	Specialty - Other Food	Hospitality and Entertainment	Specialty - Other Retail & Services	Specialty - Clothing and Soft Goods	Department Stores & DDS	Bulky/Household Goods	Total (Occupied)
Floorspace	3,800	666	3,496	583	749	0	2,164	**11,458**

Source: SGS, 2017

Approximately 1,665 square metres of GFA is estimated to be vacant as at January 2017, which indicates a retail vacancy rate for the centre of 14.5%, which is relatively high for an established suburban market.

Eastwood

Eastwood is a predominantly main street-based, neighbourhood centre focussed around Rowe Street on both the eastern and western side of the railway line. Eastwood is located approximately 3 kilometres from the Epping town centre. The majority of retail floorspace and retail activity occurs on the western side of the rail line. The centre contains significant Chinese and Korean restaurants and shops to cater to the needs of local residents of these ethnicities. Eastwood Shopping Centre is the largest retail landholding in the centre, and is an enclosed shopping centre containing Woolworths and a large local bulky goods retailer. Eastwood also contains an Aldi supermarket and three independent supermarkets. The estimated retail floorspace of the Epping town centre at 2017 is shown in Table 6.

TABLE 6. FLOORSPACE BY RETAIL TYPE - EASTWOOD

	Supermarkets/ Convenience stores	Specialty - Other Food	Hospitality and Entertainment	Specialty - Other Retail & Services	Specialty - Clothing and Soft Goods	Department Stores & DDS	Bulky/Household Goods	Total (Occupied)
Floorspace	5,130	5,452	6,025	4,045	1,264	361	9,009	**31,286**

Source: SGS, 2017

An estimated 2,074 square metres GLA of retail space is estimated to be vacant in Eastwood, which reflects an estimated vacancy rate of 6.6 per cent of total GLA in the centre.

Carlingford

Carlingford centre is located around the junction of Carlingford Road and Pennant Hills Road approximately 3 kilometres from Epping town centre. Carlingford is anchored by a sub-regional shopping centre (Carlingford Court) and a smaller enclosed shopping centre (Carlingford Village). Additional bulky goods retail (including Bunnings) and high street retail is located along the two main roads. Carlingford Court contains Target, which is the only discount department store (DDS) in the local market and it also contains full line Woolworths and Coles supermarkets, in additional to approximately 100 speciality retailers. The estimated retail floorspace of the Carlingford centre at 2017 is shown in Table 7.

TABLE 7. FLOORSPACE BY RETAIL TYPE - CARLINGFORD

	Supermarkets/ Convenience stores	Specialty - Other Food	Hospitality and Entertainment	Specialty - Other Retail & Services	Specialty - Clothing and Soft Goods	Department Stores & DDS	Bulky/Household Goods	Total (Occupied)
Floorspace	9,083	833	1,211	968	287	8,009	19,628	**40,019**

Source: SGS, 2017

An estimated 1,800sq.m. GLA of retail space is estimated to be vacant in Carlingford, which reflects an estimated vacancy rate of 4.5 per cent of total GLA in the centre.

Development pipeline

A review of retail developments in the pipeline has been undertaken using Cordell Connect data to determine likely future retail supply. Retail developments planned or under construction within the catchment have been considered. A summary of the findings is shown in Table 8, including proposed retail floorspace in the Epping town centre replaces some existing retail floorspace. Appendix 8.3 provides further detail on the retail development in the pipeline.

TABLE 8. RETAIL PROJECTS IN LOCAL RETAIL MARKET AS AT MAY 2017

	Epping	Eastwood	Carlingford
New floorspace	6,512	2,764	499
Floorspace to be replaced	2,366	0	0
Net new floorspace	4,146	2,764	499

Source: Cordell Connect (2017)

Table 9 below outlines the existing estimated retail floorspace by food and non-food retail floorspace in the three centres.

TABLE 9. SUMMARY OF ESTIMATED FLOORSPACE SUPPLY IN THE LOCAL MARKET

	Epping	Eastwood	Carlingford	Total - 2016
Estimated Food floorspace	7,962	16,606	11,127	35,695
Estimated Non-Food floorspace	3,496	14,678	28,892	47,066
Vacant space	1,665	2,074	1,800	5,539
Vacancy rate	14.5%	6.6%	4.5%	6.7%
Total Floorspace	**13,124**	**33,358**	**41,819**	**88,300**

5.2 Retail floorspace demand

Calculating retail floorspace demand

Primary Trade Areas

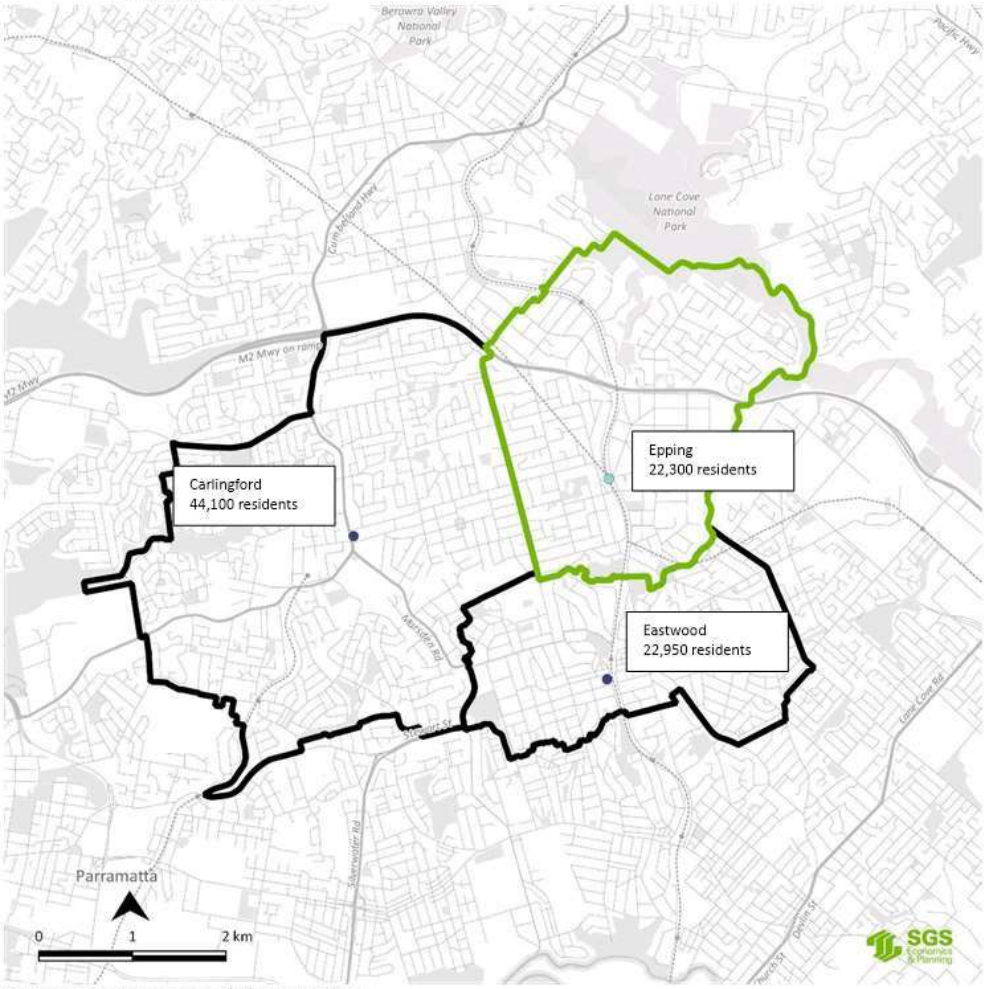
Primary Trade Areas (PTAs) have been estimated for the three retail centres outlined above. As the term suggests, residents within PTA boundaries of a centre primarily (but not exclusively) visit the local centre to satisfy their retail needs. PTAs reflect the convenience and competitive nature of the retail market and have been drawn considering the scale and variety of retail in each centre, the proximity to other centres, transport connections and geographic barriers. Residents outside a centre's PTA boundaries shop primarily at another centre, or several centres if their area is contested by multiple centres in close proximity.

The PTAs for the three centres are shown in Figure 26. The PTA boundaries are somewhat irregular as they are based on Travel Zones (TZs) as defined by Transport for NSW. These TZs are the smallest available geographies for which the latest small area population and employment forecasts are available to conduct demand modelling.

Macquarie Park has been treated as an out of catchment retail centre for this study due to the complexity of modelling its regional-scale catchment, the centre's variety of retail uses, extensive time required to survey and categorise its current floorspace mix and uncertainty around the specifics of its planned expansion. From a retail network perspective, Macquarie Park plays a complementary role to the three local market centres: its higher order offer fulfils retail needs that aren't available locally but it lacks the convenience and open public realm that smaller centres provide.

Secondary trade areas (STAs) are sometimes used in retail analysis, but have not been considered as part of this analysis given the complexity of the suburban retail market and project scope. STAs expand the geographic area for analysis, which introduces further subjectivity to the modelling (e.g. estimates of where secondary sources of expenditure for each centre will come from, relative to other centres). They also increase the required data on floorspace supply in the region (for centres further away from the local market), collection of which is beyond the scope of this project. Instead, total demand from beyond the PTAs for the three have been modelled for both centres based on known trade patterns, and this "Beyond PTA" pool of demand comprises all secondary, tertiary and incidental expenditure, without complex geographic distinctions.

FIGURE 26. PRIMARY TRADE AREAS & RESIDENTS – EPPING, EASTWOOD AND CARLINGFORD



Source: SGS Economics and Planning, 2017

Current retail expenditure

Data from MarketInfo has been used to determine current expenditure profiles for the PTAs. MarketInfo profiles expenditure of Australian households per capita by nine categories are regarded as an industry standard and incorporates the ABS Household Expenditure Survey and Census to reflect local expenditure patterns driven by factors such as age, ethnicity, household structure etc. MarketInfo data was applied to each Statistical Area 1s (SA1) within the PTAs. Table 10 shows the average per capita expenditure by commodity group in 2016 AUD for residents in each PTA.

TABLE 10. PER CAPITA EXPENDITURE (2016)

MarketInfo 2016 $	Food & Groceries	Bottleshop/ Tobacco	Restaurants & Cafes & Take-away	Clothing & Shoes	Furniture, Whitegoods, Homeware, Manchester & Electronics	Hardware & Garden	Other Retail	Retail Services	Total
Epping PTA	$5,404	$646	$2,753	$1,627	$2,529	$697	$1,663	$647	**$15,966**
Eastwood PTA	$5,186	$566	$2,484	$1,402	$2,240	$551	$1,419	$530	**$14,378**
Carlingford PTA	$5,115	$645	$1,763	$942	$1,814	$597	$1,312	$430	**$12,618**

Source: SGS Economics and Planning 2017, using MarketInfo 2014

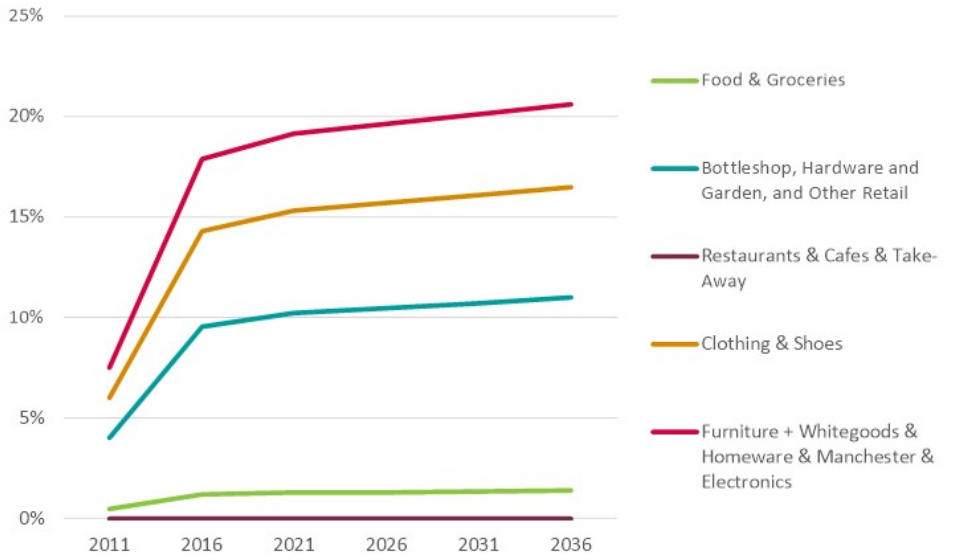
Online expenditure

Following international trends, the retail industry in Australia is transitioning to a multi-modal structure, with sales growth in online retailing estimated by the ABS[27] to have grown by 31 per cent, 23 per cent and 15 per cent in 2014, 2015 and 2016, respectively.

SGS has applied these growth rates in Figure 27 to the 2011 Productivity Commission estimates of the proportion of online retail expenditure as a percentage of total retail expenditure in Australia by commodity. This approach establishes the likely percentage of online expenditure in the future. Growth in future years has been estimated based on the reduction in the rate of growth from ABS estimates year on year from 2013 to 2016. It is anticipated that online retailing will reach maturity in the 2020s.

Online retailing expands the geographic area that goods can conveniently be purchased from, and thus reduces the demand for local floorspace. Reflecting this, commodity expenditure per capita in Table 10 has been reduced by the corresponding percentages in Figure 27 for local floorspace demand calculations.

FIGURE 27. PERCENTAGE OF RETAIL EXPENDITURE ONLINE BY YEAR – FORECAST 2016 TO 2036



Source: SGS Economics and Planning, 2017 using Productivity Commission, 2011 and ABS, 2016

[27] Australian Bureau of Statistics, *8501.0 - Retail Trade, Australia*, Dec 2016, http://www.abs.gov.au/AUSSTATS/abs@.nsf/Latestproducts/8501.0Appendix1Dec%202016?opendocument&tabname=Notes&prodno=8501.0&issue=Dec%202016&num=&view=

Epping PTA – current and future demand

Population in the Epping PTA is forecast to grow at an average annual rate of 2.3% through to 2036. Population forecasts at five year intervals are shown in Table 11.

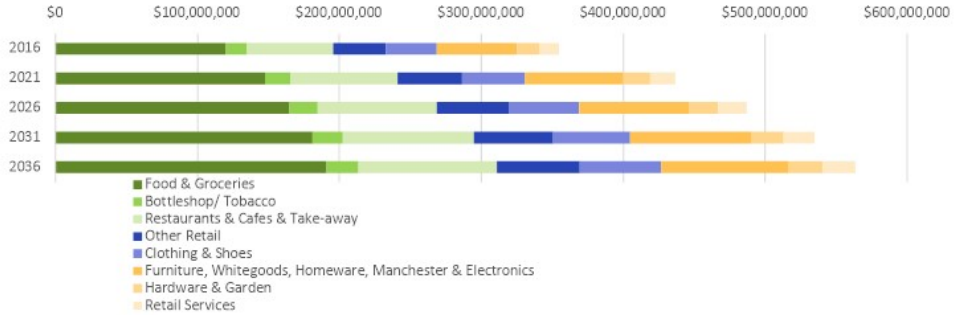
TABLE 11. EPPING PTA POPULATION - 2016-2036

	2016	2021	2026	2031	2036
Epping PTA	22,230	27,365	30,500	33,496	35,299

Source: TPA, 2016 with SGS Calculations

Applying the per capita retail expenditure from MarketInfo (Table 10) to the TPA population forecasts for the Epping PTA provides total expenditure from residents by interval year in Figure 28. Note that inflation has not been applied to keep expenditure in real terms for useful comparison.

FIGURE 28. EXPENDITURE IN EPPING PTA BY YEAR (CONSTANT 2016 $ AUD)



Source: SGS Economics and Planning, 2017 using MarketInfo, 2014, TPA, 2016 and AECgroup, 2016

Figure 29 converts per capita retail expenditure to retail floorspace demand applying SGS' matrices and industry average Retail Turnover Densities (see Appendix 8.1 for further detail).
Table 12 shows the floorspace demand for the Epping town centre after accommodating for escape expenditure.

FIGURE 29.FLOORSPACE DEMAND BY YEAR - EPPING (CONSTANT 2016 $ AUD)

Source: SGS Economics and Planning 2017, using MarketInfo 2014, TPA 2016

TABLE 12. EPPING PTA FLOORSPACE DEMAND (SQUARE METRES)

	2016	2021	2026	2031	2036
Total supportable floorspace	15,291	18,804	20,950	22,999	24,226

Source: SGS Economics and Planning, 2017

Eastwood and Carlingford PTAs

The PTA populations of these centres are outlined in Table 13:

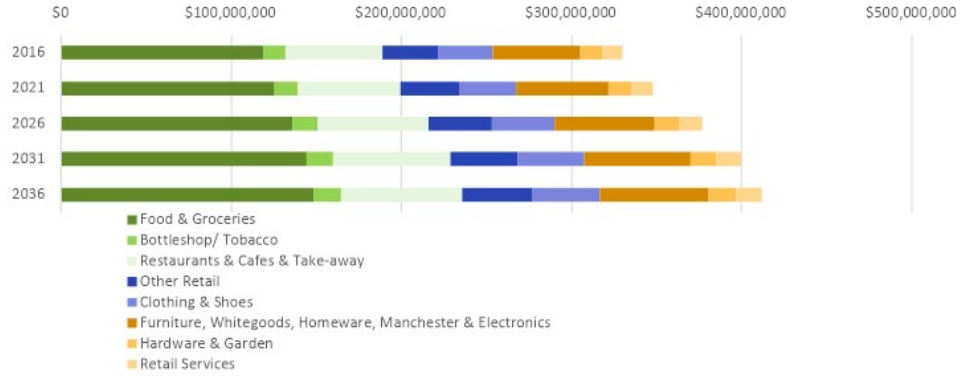
TABLE 13. EASTWOOD AND CARLINGFORD PTA POPULATION: 2016-2036

	2016	2021	2026	2031	2036
Eastwood PTA	22,961	24,213	26,226	27,819	28,643
Carlingford PTA	44,154	50,841	55,222	59,468	62,864

Source: TPA, 2016

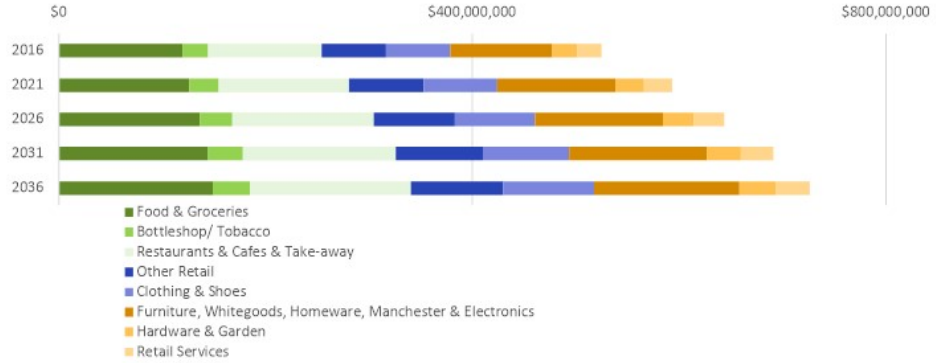
As per with Epping, applying the per capita retail expenditure from MarketInfo (Table 10) to the population forecasts for the respective centres' PTAs provides total expenditure from residents by year in Figure 30 for the Eastwood PTA, and for the Carlingford PTA in Figure 31.

FIGURE 30. EXPENDITURE IN EASTWOOD PTA BY YEAR (CONSTANT 2016 $ AUD)



Source: SGS Economics and Planning 2017, using MarketInfo 2014 and TPA 2016

FIGURE 31. EXPENDITURE IN CARLINGFORD PTA BY YEAR (CONSTANT 2016 $ AUD)



Source: SGS Economics and Planning 2017, using MarketInfo 2014 and TPA 2016

Total demand for retail floorspace from Eastwood PTA residents is summarised in Table 14.
:

TABLE 14. EASTWOOD AND CARLINGFORD PTA FLOORSPACE DEMAND (SQUARE METRES)

	2016	2021	2026	2031	2036
Eastwood	14,704	15,491	16,772	17,783	18,303
Carlingford	28,277	32,526	35,316	38,016	40,170

5.3 Supply/demand gap analysis

Epping

The proportion of the floorspace demand from PTA residents which can reasonably be served by the Epping centre has been calculated in the second row of Table 15. This 'Target Market Share' has been derived as follows:

1. Applying standard industry turnover densities[28] (See Appendix) for the retail floorspace categories to the provision in Epping.
2. Estimating the proportion of the total turnover originating from PTA shoppers (50%)
3. Calculating the turnover from PTA residents at the Epping centre as a proportion of their total retail expenditure

TABLE 15. EPPING - FLOORSPACE DEMAND VS. CURRENT SUPPLY (SQ.M.) EX. VACANT

FOOD	2,016	2,021	2,026	2,031	2,036
PTA floorspace Demand	**15,291**	**18,804**	**20,950**	**22,999**	**24,226**
PTA demand serviced in Centre (50% of trade)	4,321	5,313	5,920	6,499	6,845
50% external demand (from shoppers originating beyond PTA)	4,321	5,313	5,920	6,499	6,845
Total Supportable Demand	**8,642**	**10,627**	**11,840**	**12,997**	**13,691**
	2,016	**2,021**	**2,026**	**2,031**	**2,036**
Occupied	7,962	7,962	7,962	7,962	7,962
Over (Under) supply	**-679**	**-2,664**	**-3,877**	**-5,035**	**-5,729**

NON- FOOD	2,016	2,021	2,026	2,031	2,036
PTA floorspace Demand	**21,801**	**26,551**	**29,471**	**32,227**	**33,812**
PTA demand serviced in Centre	5,353	6,519	7,236	7,912	8,302
External demand (Beyond PTA)	5,353	6,519	7,236	7,912	8,302
Total Supportable Demand	**10,705**	**13,038**	**14,472**	**15,825**	**16,603**
	2,016	**2,021**	**2,026**	**2,031**	**2,036**
Occupied	3,496	3,496	3,496	3,496	3,496
Over (Under) supply	**-7,209**	**-9,542**	**-10,975**	**-12,329**	**-13,107**

Source: SGS Economics and Planning 2017

[28] Reduced from the NSW average to reflect the low socio-economic status of Epping and accordingly lower turnover expectations for businesses in the market.

TABLE 16. EPPING SUPPLY SURPLUS/DEFICIT CALCULATIONS ('OOO SQ.M.)

No supply change	2016	2021	2026	2031	2036
Food under supply	-679	-2,664	-3,877	-5,035	-5,729
Non-food under supply	-7,209	-9,542	-10,975	-12,329	-13,107
Vacant space	1,665	1,665	1,665	1,665	1,665
Total Net Over (Under) supply:	**-6,223**	**-10,541**	**-13,188**	**-15,698**	**-17,170**

With pipeline developments	2016	2021	2026	2031	2036
Food	-679	-2,664	-3,877	-5,035	-5,729
Non-food	-7,209	-9,542	-10,975	-12,329	-13,107
Vacant space	1,665	1,665	1,665	1,665	1,665
Additional retail space (Culm.)		4,146	4,146	4,146	4,146
Total Net Over (Under) supply:	**-6,223**	**-6,395**	**-9,042**	**-11,552**	**-13,024**

Source: SGS Economics and Planning 2017

The target market share for the centre equates to 28% for food, and 25% for non-food of PTA floorspace. These targets are consistent with the calculated market shares of comparable centres in suburban areas undertaken in previous research. In addition to demand from residents in a centre's PTA an additional 40% - 50% of trade in a centre of Epping's size and role is typically sourced from shoppers originating outside the PTA (50% has been assumed, based on known trade patterns of businesses operated in the centre). Floorspace demand has accordingly been calculated to provide a total serviceable demand.

Combined local market

Viewing Epping's supply/deficit in isolation is a necessary but insufficient precondition to determining if the local market is in equilibrium

It is not realistic to expect neighbourhood scale centres to fulfil the complete retail needs of residents in their local primary trade areas. Indeed, escape expenditure occurs to some extent even from residents living close to large regional scale centres. Reflecting this, supply/demand needs to be reviewed in terms of the total local market, and target market shares for Eastwood & Carlingford have been calculated and applied. Note that while Eastwood is comparable to Epping in terms of food/non-food business mix (albeit a larger neighbourhood centre) and therefore a similar 50% estimate of PTA/beyond PTA trade has been made, Carlingford is a higher order (sub regional) centre capturing a higher proportion (55% est.) of trade from beyond its primary trade area and slightly higher target market shares.

TABLE 17. COMBINED SUPPLY SURPLUS/DEFICIT CALCULATIONS ('OOO SQ.M.)

With known developments	2016	2021	2026	2031	2036
Food	195	-4,945	-8,703	-12,182	-14,550
Non-food	3,177	-2,876	-7,292	-11,358	-14,065
Vacant space	5,539	5,539	5,539	5,539	5,539
Additional retail space (Culm.)		7,409	7,409	7,409	7,409
Net over (under supply)	**8,911**	**5,126**	**-3,047**	**-10,592**	**-15,667**
	10%	**5%**	**-3%**	**-11%**	**-16%**

Source: SGS Economics and Planning 2017

5.4 Implications

Current floorspace from the combined centres' is only slightly in excess of demand
10% is only a moderate over-supply given the limitations of the modelling and data used. A number of empirical facts support the conclusions for the modelling:

- Vacancies in Epping suggest there is some slack in the market, though this may just be frictional given the lull between the conversion of office space in the centre and the occupation of residential development.
- The known turnover of some of the largest chain businesses in the local market are comparable to or slightly lower than their fleet[29] averages. An under-supply of space would have these trading above their respective fleet averages.
- The quantum of planned retail floorspace in the development pipeline is not transformative, and some of it is only incremental – e.g. the replacement or reconfiguration of existing space at Eastwood Shopping Centre.
- Regional centres at Macquarie Park etc. will also be fulfilling some of the local demand – particularly for higher order non-food needs such as household & bulky goods (available at department stores and specialised mini majors).

With the current population projections and pipeline of retail developments adding to supply, the market is forecast to be close to equilibrium until the early 2030s
An increase in floorspace beyond approximately 5,000 square metres across the local market centres (on top of the expected quantum of floorspace coming to market indicated by Cordell in Epping, Carlingford and Eastwood) by 2021 would result in disequilibrium, assuming no change to current trade patterns. This would have a dilutive effect on the turnovers of existing businesses, although gravity modelling would be required to estimate whether this would be excessive[30]. The forecast population figures reflect planning controls developed under the Epping Priority Precinct process. They do not reflect recent planning proposals submitted to Parramatta Council in excess of these existing controls.

Epping and Carlingford play complementary roles in the local retail system, meeting demand for retail uses now and into the future
Epping and Eastwood serve PTAs of a similar size in terms of residents, whereas Carlingford serves a geographically and numerically larger catchment due to its strategic location in the road network, centre scale and variety of retail tenancies. Eastwood has developed into a specialised neighbourhood centre, catering to the local populations of particularly Chinese and Korean ethnicity and providing a unique hospitality offering attracting spend from outside of the centre.

Epping and Carlingford are located at either end of Carlingford Road. These two centres are in close proximity and fulfil complementary roles. Carlingford provides a higher order retail offering and comparison retailing while the Epping town centre offer convenience retailing and hospitality offerings in a higher accessible location. These two centres act as two ends of a 'dumbbell' along Carlingford Road. Demand for approximately 13,000 square metres of retail floorspace is forecast for the Epping town centre over the next 20 years.

[29] 'Fleet' referring to the average turnover of all the stores for particular brands throughout Australia

[30] I.e. greater than 10%, or sufficient to reduce average turnover densities below industry averages.

6 OFFICE DEMAND ASSESSMENT

This Chapter assesses the demand for office floorspace in the Epping town centre. This assessment considers all industries apart from retail and accommodation and food service, which were forecasted separately in Chapter 5. To forecast demand for office floorspace to 2036 this Chapter considers the competitive offer of the Epping town centre and assesses three possible future scenarios.

6.1 Value of office uses in the Epping town centre

Retaining office uses is important to the sustainability of commercial centres such as Epping. This retention is particularly important in light of the 30-minute city prioritised by the GSC, where more services and jobs should be available within easy reach of residents'. Though there are some costs associated with this, there are also important benefits for both businesses and residents from doing so.

The main costs of providing and retaining office uses over other types of use may be felt by existing land owners and potential developers of sites, as the land is not being put to its most profitable use in the current market, which is housing. Retaining office space can also been seen as a cost for potential home buyers or State and local governments, as the potential space for housing in the area becomes limited.

However, the benefits of the retention of office uses include the ability to maintain an employment base in the centre. This has further benefits for a given location in ensuring day-time activity, and in supporting retail trade and other businesses, and in reducing the need to travel for the local workforce if jobs can be found locally. The aim for significant centres on the rail line with high levels of accessibility should be to maximise the diversity of uses, without contributing to scale diseconomies or undermining aims for the employment role of strategic centres. Making provision for space for office and commercial uses is also important in planning for the long-term needs of centres and communities, as once spaces are converted for residential development it is difficult and unlikely to be changed back to support such uses should demand for different types of space change over time.

6.2 Competitive offer of Epping town centre

Consultation and market research suggests that as a commercial centre, Epping is likely to be in competition with several large and small nearby centres, including Macquarie Park, Chatswood, Norwest Business Park, the Parramatta CBD, Rhodes, Hornsby, Pymble and Pennant Hills. A multi-criteria assessment of Epping and these centres against a series of attributes is shown in Table 18. These locational and other attributes are important for commercial centres to be successful, and are discussed below.

Locational attributes

Existing commercial precinct

An established commercial precinct is likely to attract further businesses to the area, as locating in an area of dense economic activity allows for economies of scale and access to larger customer bases for firms. Each centre has been ranked as low, medium or high based on their existing concentration of commercial premises and activity.

Existing population and projected residential population
The existing population of the suburb for each centre has been identified using BTS data by travel zone, along with the projected population in the next 15 and 30 years.[31] This gives an indication of the likely population catchment and customer base that each of the centres will be servicing in future.

Office floorspace
Office floorspace has been identified in square metres for each centre, based on published data, and includes occupied and vacant space.[32] The current vacancy rate for office space in each centre has also been identified where possible. The availability of space in commercial centres affects the desirability for and ability of new businesses to locate in a particular centre.

Availability of different sized floorspaces
The availability of different sized floorspaces in each centre has been noted, based on existing market research and current listing for spaces. Larger office floorplates (e.g. 1.000+ square metres) allow for larger corporations to locate in commercial centres, particularly businesses that want to have their full range of functions in one place rather than across multiple buildings or centres. Business parks have an advantage in this area, though larger commercial centres tend to offer larger floorplates as well. The flexibility of spaces can also be important to be able to suit different types of tenants.

Rental prices for commercial space
The cost of leasing commercial space is an important factor in where businesses choose to locate. A desktop assessment of advertised rents for office and retail spaces per square metre in each of the competing centres has been undertaken, and each ranked on a scale of low, medium, and high costs. Rental costs for each are also likely to be influenced by the quality of available stock, with A-grade space generally limited to the larger centres.

Road transport accessibility
Successful commercial centres need to be accessible to the labour force and to markets, with highly accessible locations preferred for commercial development. Access to arterial roads to connect commercial spaces to employees, clients and services are important. Each centre has been given a low, medium or high rating based on their accessibility to major roads.

Car parking
The availability of parking spots is important to employees, clients and customers of office and retail businesses. A low, medium or high rating has been given to each location based on the availability of public car parking spaces and whether car space levies apply in the area.

Exposure for retail
Exposure to passing trade is more important for retail premises than for office uses, though it can be a selling point for other commercial spaces. A low, medium or high rating has been given to each centre based on their proximity to major roads and centres of activity to give an indication of the number of people who are likely to drive or pass by.

[31] Based on travel zones within suburb of each centre. For Norwest Business Park, the suburbs immediately surrounding have been used.

[32] Estimates have been obtained from recent office market reports including: Savills, 2017, 'Briefing – North Shore Office,' http://pdf.savills.asia/asia-pacific-research/australian-research/australia-office-/savillsresearch-briefing-north-shore-office-q4-2016.pdf; Property Council of Australia, 2017, 'Macquarie Park's Office Market Lagging,' https://www.propertycouncil.com.au/Web/Content/Media_Release/NSW/2017/Macquarie_Park_s_office_market_lagging.aspx; Cummins, 2016, 'Norwest Business Park close to 'house full'' http://www.smh.com.au/business/property/norwest-close-to-house-full-20160413-go5j8h.html; Savills, 2017, ' Briefing – Parramatta Office,' http://pdf.savills.asia/asia-pacific-research/australian-research/australia-office-/savillsresearch-briefing-parramatta-office-q4-2016.pdf; Colliers International, 2014, *Sydney Office Market Research Report*, prepared for NSW Planning and Infrastructure, June 2014, http://www.planning.nsw.gov.au/~/media/Files/DPE/Reports/sydney-office-market-research-report-2014-06.ashx

Public transport accessibility
Accessibility by public transport is also an important factor in the success and attractiveness of commercial centres, particularly as more jobs are concentrated in knowledge intensive industries in city centres rather than in outlying and industrial precincts. A poor, fair or excellent rating has been given to each centre based on the availability of different modes of public transport and the frequency of services.

Anchor activities
The main activities and services that are available in each of the centres have been identified. This gives an indication of the level of amenity in each area, with facilities such as banks and supermarkets important for commercial centres to be built around. These types of facilities can also be attractive features for businesses to be located near.

Access to magnet infrastructure
Access to large scale infrastructure can be important for commercial centres in attracting tenants and in acting as an anchor for new development. Infrastructure such as universities can also provide access to greater populations (e.g. students), and opportunities for knowledge sharing and agglomeration benefits for businesses. A low, medium or high rating has been given to each centre based on their proximity to facilities including hospital, universities and other educational facilities.

Hospitality, retail and social infrastructure uses
Having cafés or restaurants, retail, and social infrastructure (such as child care centres) close by can be attractive for businesses, as they provide amenity to their employees, with a variety of food and drink options likely to be more desirable. Each of the locations has been rated low, medium or high based on the concentration and variety of these types of uses in their centres.

Urban amenity
The quality of the urban environment in a centre can also be an important attractor to businesses, with public spaces that are more pleasant and vibrant likely to be more desirable. A low, medium or high rating has been given to each centre based on their provision of open space and the quality of streetscapes.

Professional population
Access to a professional pool of potential employees and clients can be important to the sustainability of commercial centres. The proportion of the resident population classified as professional in the 2011 Census at the State Suburb (SSC) level has been identified for each centre.[33]

Tertiary educated population
Access to an education population is also important for commercial centres. Using the same SSC areas from 2011, the proportion of the population with a bachelor's degree or higher qualification has been identified for each of the centres.

[33] Based on 2011 Census, State Suburbs (SSC) – Epping (NSW), Macquarie Park, Chatswood, Baulkham Hills, Bella Vista, Rhodes, Parramatta, Hornsby, Pymble, and Pennant Hills.

TABLE 18. COMPETITIVE OFFER ASSESSMENT

	Epping town centre	Macquarie Park	Chatswood	Norwest Business Park	Parramatta CBD	Rhodes	Hornsby	Pymble	Pennant Hills
Existing commercial precinct	Medium. Competition from Macquarie Park and residential uses.	High. Business Park in Global Economic Corridor.	High. Strategic centre in Global Economic Corridor. Some competition from residential uses.	High. Business park and primarily commercial uses.	High. Major commercial centre and Strategic Centre	High. Established commercial precinct.	Medium. Competition from Macquarie Park and residential uses.	Medium. Localised commercial uses as well as office park precinct.	Low. Limited office space. Competition from other centres.
Existing and projected residential population	**2016: 29,223** 2031: 42,173 2046: 54,574 (87% growth 2016-2046)	**2016: 7,103** 2031: 17,630 2046: 21,605 (204% growth 2016-2046)	**2016: 28,718** 2031: 33,230 2046: 41,558 (45% growth 2016-2046)	**2016: 12,463** 2031: 26,255 2046: 36,699 (194% growth 2016-2046)	**2016: 20,730** 2031: 45,632 2046: 64,253 (210% growth 2016-2046)	**2016: 11,888** 2031: 17,894 2046: 21,551 (81% growth 2016-2046)	**2016: 24,031** 2031: 27,743 2046: 32,746 (36% growth 2016-2046)	**2016: 11,458** 2031: 13,809 2046: 17,324 (51% growth 2016-2046)	**2016: 8,692** 2031: 9,400 2046: 11,214 (29% growth 2016-2046)
Office floorspace	Approx. 55,000 sqm. Very low vacancy rate.	Approx. 873,000 sqm. Slowly increasing vacancy rate, estimated at 7.5%.	Approx. 278,000 sqm. Estimated 7.7% vacancy rate.	Approx. 58,000 sqm. Low vacancy rate, estimated at 6%.	Approx. 707,000 sqm. Low vacancy rate, estimated at 4.3%.	Approx. 144,000 sqm. Low vacancy rate. Limited capacity for expansion.	Approx. 27,490 sqm*	Approx. 79,000 sqm*	Approx. 1,994 sqm*
Type of office floorspace available	Small floorplates only. Larger businesses relocated to other centres, remaining floorspace limited in size.	Large and small floorplates. Currently attracting larger tenants from other centres.	Large and small floorplates.	Large and small floorplates. Business park format allows for larger floorplates.	Large and small floorplates. Attracting tenants looking for larger spaces and CBD location.	Large and small floorplates.	Smaller floorplates only.	Smaller floorplates only.	Smaller floorplates only. Limited office stock in general.
Rental Prices (office and retail)	Low	Medium	High	Medium	High	Medium	Low	Medium	High**
Road transport accessibility	Medium. Beecroft Road connecting to M2, some congestion at peak times.	High. M2, though some congestion around afternoon peak.	High. Pacific Highway, though some congestion at peak times.	Medium. Close to M7 and Old Windsor Road, congestion within Park around peak times.	High. M4, though congestion at peak times.	Medium. Close to M4, but congestion particularly at peak times.	Medium. Nearby to Pacific Motorway, limited congestion.	High. Pacific Highway, limited congestion around centre.	Medium. Pennant Hills Road connects to M2 and Pacific Motorway, significant congestion.

	Epping town centre	Macquarie Park	Chatswood	Norwest Business Park	Parramatta CBD	Rhodes	Hornsby	Pymble	Pennant Hills
Car parking	Medium. No parking meters, but high utilisation of Council car park and on-street spaces.	Low. On-street parking fees recently increased in response to congestion.	Low. NSW Parking Space Levy applies. Council has aimed to limit amount of parking in the area.	Medium. Space provided with most buildings, and available at shopping centre.	Low. NSW Parking Space Levy applies. Most Council- provided spaces limited to short stays (4 hours or less).	Medium. Effort by Council to reduce number of cars and spaces, but free 3-hour parking available at shopping centre.	Low. Spaces in town centre generally occupied by early morning, especially untimed spaces.	Medium. Parking provided with business park buildings. Some on street and Council-run car parks available.	Low. Congestion an issue for residents. Lack of commuter spaces at railway and all-day spaces.
Exposure (primarily for retail)	High. Particularly on Beecroft Road.	Low. Retail spaces concentrated in shopping centre, motorway traffic separated from centre.	Low. Retail spaces concentrated in shopping centre, limited frontage on Pacific Highway.	Low. Separated from major arterial roads, shopfronts separated by landscaping and parking.	High. Retail not concentrated in one location, population and employment growth increasing potential exposure.	Low. Retail uses concentrated in shopping centre and largely separated from major traffic routes.	Medium. Main retail uses in shopping centre and separate from major traffic route.	Medium. Some retail uses front Pacific Highway, others within internal business park area.	Medium. Main retail area separated from Pennant Hills Road.
Public transport accessibility	Excellent. Bus and rail access. Future Metro Northwest station. Frequent services.	Excellent. Bus and rail access. Two Metro Northwest stations. Frequent services.	Excellent. Bus and rail access. Metro Northwest station. Frequent services.	Poor. Bus access only. Less frequent services.	Excellent. Bus rail and ferry access. Frequent services.	Fair. Bus and rail access. Less frequent services.	Fair. Bus and rail access. Less frequent services.	Fair. Bus and rail access. Less frequent services.	Fair. Bus and rail access. Les frequent services.
Anchor activities	Council facilities, major supermarket, health services.	State government facilities, major supermarkets, major shopping centre, banks, hospital, health services.	Major supermarkets, major shopping centre, State government facilities, banks, health services.	Major supermarkets, banks, some health facilities.	Council and State government offices, major supermarkets, major shopping centre, health services	Major supermarket, health services, shopping centre, banks.	Council facilities, major shopping centre, major supermarkets, TAFE.	Smaller supermarkets, banks, health services.	State government offices, smaller supermarkets, health services, banks.
Access to magnet infrastructure	Low. No major institutions close by.	High.	Medium.	Medium.	High.	Medium. Close to Concord Hospital, private hospitals, TAFE campus.	Medium. Close by to Hornsby Ku-ring-gai Hospital.	Low.	Low.

	Epping town centre	Macquarie Park	Chatswood	Norwest Business Park	Parramatta CBD	Rhodes	Hornsby	Pymble	Pennant Hills
		Close to Macquarie University, Macquarie University Hospital.	Close to several private colleges, private hospitals, nearby to UTS campus.	Nearby to TAFE and private colleges, and Norwest Private Hospital.	WSU campus, future UNE campus, close to Westmead, CBD location.				
Hospitality, retail and social infrastructure	Medium. Council library, mix of retail, large range of food outlets, limited child care centres currently.	High. Major shopping centre retail, child care centres, range of food options.	High. Council library, major shopping centre retail, child care centres, range of food options.	Medium. Range of shops and food outlets at Marketown shopping centre, child care centres.	High. Council library, major shopping centre retail, range of food options, child care centres.	High. Major shopping centre retail, range of food options, many child care centres.	Medium. Council library, major shopping centre retail, mix of local and chain food outlets, few child care centres.	Low. Limited retail offering, mostly local food outlets, limited child care centres.	Medium. Council library, mix of local and chain food outlets, limited retail offering, some child care centres.
Urban amenity	Medium. Major roads remain car dominated. Limited open space in the centre. Good location for transport accessibility.	Medium. Limited after-hours activity, but likely to improve with residential and commercial expansion.	High. Limited public open space, but some pedestrianised areas. Good accessibility.	Low. Car dominated environment. Large distances between buildings less conducive to pedestrian amenity.	High. Limited public and green space currently, but improving. Good accessibility.	Medium. Green space nearby and some pedestrianised areas. Good accessibility, but car dominated particularly on Concord Road side.	Medium. Some open space nearby but not in centre.	Medium. Some public spaces. Some pedestrianised areas but largely car dominated, particularly in business park area.	Low. Limited public space. Car dominated.
Professional population	19.6%	18.7%	18.0%	15.1%	14.9%	18.4%	16.6%	19.1%	18.3%
Tertiary educated population	35.1%	36.4%	35.3%	22.9%	32.9%	40.4%	29.1%	37.5%	32.2%

*Floorspace estimates from *Ku-ring-gai & Hornsby Subregional Employment Study*, SGS Economics & Planning, 2008. Estimate for Pymble includes Pymble Business Park.
**High prices for Pennant Hills due to a small sample size of available commercial rental properties.

Conclusions on Epping's competitive offer

Epping's resident population is expected to be larger than the other suburban centres like Hornsby, Pymble and Pennant Hills, and is expected to have a high rate of growth over the next 30 years. Epping will also have a larger resident population than Macquarie Park, and have a comparable level of highly educated and professional people to draw on.

Epping generally has the benefit of lower prices for office rentals than the larger centres, however, this is likely to be attributable to a lack of A-grade stock in the area. The currently low vacancy rate for office space limits the competitiveness of Epping, particularly when the larger centres have more space overall and higher vacancy rates (with the exception of Parramatta).

The limited availability of large floorplates is a disadvantage for Epping compared to Norwest and the major centres in attracting larger office tenants, and as identified previously, this is being exacerbated by the encroachment of residential uses into the commercial core. Residential conversions are also affecting some of the other centres such as Macquarie Park and Hornsby, though perhaps not to the same extent.

Epping ranks well for its transport accessibility, on par with the major centres in the Global Economic Corridor, being in close proximity to major arterial roads as well as frequent public transport routes, including the future North West Metro. The lack of a parking levy has also been noted as an advantage for Epping compared to Parramatta and Chatswood where the levy applies, though like a number of the competing areas, the availability of parking is a common issue for workers and residents.

Epping has good exposure for retail spaces, with proximity to major roads as well as a large amount of foot traffic. Retail spaces in Epping are also not concentrated within shopping centres as is the case in Macquarie Park, Chatswood, Rhodes, and elsewhere. However, Epping is likely to lack some of the prestige that is associated with these larger commercial centres which can help to attract businesses. Conversely, a high quality main street with a diverse retail and food offering can draw additional businesses to Epping, in particular small to medium enterprises.

Epping is disadvantaged in terms of immediate accessibility to major infrastructure compared to some of the other centres, including in proximity to universities and hospitals, but the centre is in close proximity to such facilities in Macquarie Park which are easily accessible by train. Epping ranks well in terms of its hospitality offering and provision of social infrastructure. Non-residential facilities will likely increase in the area as residential development continues as well, as has been the case in Chatswood. Epping is also comparable to the smaller centres in terms of urban amenity, with similar issues around the provision of public open space and the need for better pedestrian connections.

Similarities can be seen between Epping's current evolution and that of Chatswood, with the latter beginning as a largely commercial precinct before large residential developments have been introduced in recent years. Chatswood has a more significant retail role than Epping but a similar level of transport accessibility to Epping, Chatswood has a large range of retail and food options, as well as non-residential population supporting uses such as child cares and gyms.

6.3 Office floorspace demand forecast approach

Three office floorspace demand forecasts have been developed considering the findings of this report and the competitive offer of the Epping town centre. These scenarios envisage three futures where the Epping town centre takes on different roles:

- Population serving centre – office uses service the population of Epping
- Local centre – office uses service the surrounding population (e.g. a 5-10 minute catchment)
- District centre – office uses service a wider population and attract strategic employment uses (e.g. a 20-30 minute catchment).

As noted above, there have been significant changes in Epping's office floorspace in the past few years that has not been yet reflected in Census or employment projections data (the 2016 Census data should reflect the changes when released). Rather than apply the current forecasted jobs for Epping, the three scenarios approach provides an understanding of Epping's role and function considering recent trends and consultation findings.

These scenarios do not consider demand for retail and hospitality land uses in the Epping town centre. Floorspace demand from these uses is forecast separately below.

Epping as a population servicing centre

Under this scenario, land uses occupying office floorspace only service the population of Epping. For the purpose of this scenario, the population of the suburb of Epping has been applied.

Population driven employment has been estimated by performing a regression analysis to identify the type of jobs that are linked to population, and applying population-driven employment ratios to the estimated incoming population.

Through the regression analysis, we have established the causal relationship between population and employment by industry at the Statistical Area 3 (SA3) level[34]. The regression analysis coefficients have been applied to population forecasts in Transport Performance and Analytics' LU16 for the West Central District.

It is recognised that not all employment is suitable or required to be in centres. For instance, heavy manufacturing uses are more appropriate in industrial precincts to avoid land use conflict and to facilitate their specific operations, and schools are located across different urban forms (e.g. in residential areas, in centres etc.). To determine the number of jobs which would require office space in the Epping town centre, attribution rates prepared by SGS from previous commercial analysis have been applied for jobs by industry to reflect their likelihood of locating in centres.

Table 19 shows the number of jobs in the Epping town centre by GSC job classification to 2036. Under this scenario, job numbers grow in line with the forecast population of Epping, with the greatest change occurring over the five years from 2016 to 2021. The nature of this scenario sees the majority of employment driven by population serving industries.

TABLE 19. EPPING AS POPULATION SERVING CENTRE – JOBS BY GSC INDUSTRY

	2016	2021	2026	2031	2036
Knowledge Intensive	104	139	160	180	192
Population Serving	152	203	234	264	281
Industrial	15	20	24	27	28
Health and Education	141	187	216	244	260
Total	**412**	**550**	**634**	**715**	**762**

Source: SGS, 2017
Note: Jobs in Retail Trade and Accommodation and Food Services have been removed in this analysis. Floorspace for these uses is forecast separately.

Forecast jobs under this scenario are converted to office floorspace by applying a standard floorspace to job ratio of 20 square metres (while this figure has come down in more expensive office markets such as the CBD it is a robust estimate in suburban markets such as Epping). The results of this analysis are shown in Table 20. Under this scenario, if only the needs of the resident population of the suburb of

[34] Statistical Area 3 (SA3) is a geography defined by the Australian Bureau of Statistics which is used to present data in standardised regions across Australia. The regional breakups have been designed to reflect regional identity. These are areas with both geographic and socio-economic similarities.

Epping are considered, the Epping town centre has forecast supportable demand for 9,520 square metres of office floorspace in 2036. This would represent a further reduction in office floorspace in the Epping town centre.

TABLE 20. EPPING AS POPULATION SERVING CENTRE – TOTAL OFFICE FLOORSPACE BY GSC INDUSTRY

	2016	2021	2026	2031	2036
Knowledge Intensive	2,079	2,773	3,200	3,608	3,846
Population Serving	3,042	4,059	4,684	5,280	5,628
Industrial	306	408	471	531	566
Health and Education	2,811	3,750	4,327	4,878	5,200
Total	**8,237**	**10,990**	**12,683**	**14,297**	**15,240**

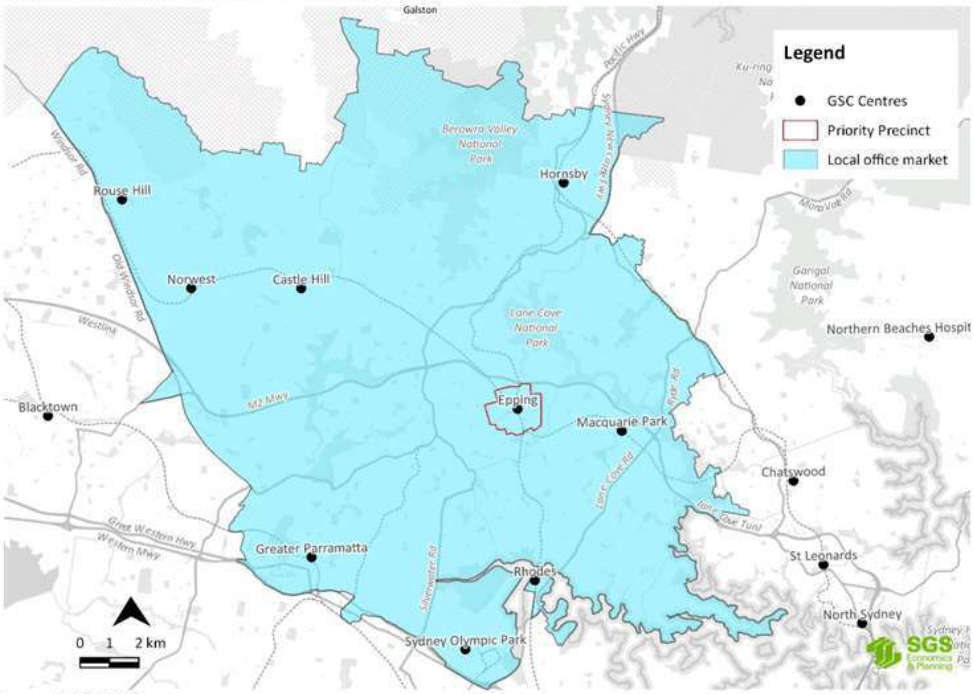
Source: SGS, 2017

Note: Jobs in Retail Trade and Accommodation and Food Services have been removed in this analysis. Floorspace for these uses is forecast separately.

Epping as local centre

This scenario forecasts the amount of commercial floorspace demand for the Epping town centre if it functions as a local centre as designated by the GSC. This approach considers Epping within its local office market informed from consultation sessions and SGS' competitive offer analysis. The local office market applied for this analysis extends to Hornsby, Pymble, Greater Parramatta and Rouse Hill as shown in Figure 32.

FIGURE 32. LOCAL OFFICE MARKET



Source: SGS, 2017

Forecast employment by Travel Zone prepared by Transport Performance and Analytics has been extracted for the local office market area. The forecast employment allocated to Strategic and District

centres within this catchment have been removed. These centres account for approximately 70% of all forecast employment in the local office market area.

The remaining forecast employment across the local office market has then been allocated evenly across local centres. Across this local office market, there are 28 local centres defined by the GSC.

Job numbers for local centres in the local office market have been further refined in recognition that not all jobs are appropriate or can be accommodated in centres. As per the previous scenario, attribution rates prepared by SGS from previous commercial analysis have been applied for jobs by industry to reflect their likelihood of locating in centres. Forecast jobs in the Epping town centre to 2036 under this scenario are shown in Figure Table 21.

TABLE 21. EPPING AS LOCAL CENTRE – JOBS BY GSC INDUSTRY

	2016	2021	2026	2031	2036
Knowledge Intensive	725	815	886	966	1,059
Population Serving	448	492	536	581	628
Industrial	18	18	18	17	18
Health and Education	397	430	459	489	522
Total	**1,587**	**1,755**	**1,898**	**2,053**	**2,226**

Source: SGS, 2017
Note: Jobs in Retail Trade and Accommodation and Food Services have been removed in this analysis. Floorspace for these uses is forecast separately.

Applying the current employment floorspace ratio of one job for every 20 square metres to the 5,674 jobs forecast for 2036 yields a floorspace forecast demand of 31,845. This is approximately 1,000 square metres more than the current occupied and vacant office floorspace in the Epping town centre.

TABLE 22. EPPING AS LOCAL CENTRE – TOTAL OFFICE FLOORSPACE BY GSC INDUSTRY

	2016	2021	2026	2031	2036
Knowledge Intensive	10,368	11,663	12,678	13,819	15,148
Population Serving	5,672	6,152	6,561	6,990	7,465
Industrial	264	262	254	248	252
Health and Education	6,403	7,034	7,663	8,316	8,981
Total	**22,707**	**25,110**	**27,156**	**29,372**	**31,845**

Source: SGS, 2017
Note: Jobs in Retail Trade and Accommodation and Food Services have been removed in this analysis. Floorspace for these uses is forecast separately.

Epping as a sub-District centre

This scenario recognises the earlier role of Epping as a professional services hub and builds upon the potential of the Epping town centre's existing and planned transport infrastructure.

SGS has applied a Sydney-wide accessibility model to forecast future jobs by Travel Zone across the metropolitan area. The accessibility model analyses the likely shift in jobs locating in centres and employment centres with the completion of the Sydney Metro.

The Sydney Metro has the potential to enhance the connectivity of the Epping town centre in future, linking the centre to the north west suburbs of Sydney and providing an additional connection to the Sydney CBD. This increased level of connectedness will have significant positive impacts to the Effective Job Density (EJD) of all centres located along the Sydney Metro Station Line.

Effective job density is a measure developed by SGS of the relative concentration of employment, derived from the density and accessibility of all jobs across a region. Areas with high employment and/or high accessibility to places of employment return higher effective job density scores. EJD can be improved by increasing jobs and reducing travel times. The travel time improvement assumptions underpinning the EJD uplift modelled for this analysis are outlined in Table 23

TABLE 23. MODELLING IMPACTS OF A SYDNEY METRO STATION ON ACCESSIBILITY BY PUBLIC TRANSPORT

Origin	Destination	Improvement to accessibility	Rationale
Metro Stations	to Metro Stations (within an 800 metre walking radius)	50%	E.g. 15 services form Epping to the CBD at peak hour via Macquarie Park
Metro Stations	to Metro Stations (within a two kilometre radius)	25%	Outer limit of train station catchment
Non-metro locations of Sydney	to Metro Stations	No change	The uplifts would not be significant enough to induce any observable land use changes.
Non-metro locations of Sydney	to non-metro locations of Sydney	No change	The uplifts would not be significant enough to induce any observable land use changes.

Source: SGS, 2017

Significant agglomeration economies will flow from the better access that the proposed Sydney Metro station provides, as the EJD of the Epping town centre improves. The Sydney-wide accessibility model determines a change in accessibility by calculating an EJD measure using travel times for the Sydney Metro, and then for a base case (i.e. a scenario that does not include the Sydney metro), using the discounted and non-discounted travel times respectively.

The accessibility model shifts the forecast growth in employment and dwellings prepared under Transport Performance and Analytics LU 16 to (or from) areas based on changes in travel time. The introduction of the Sydney Metro results in a changed EJD score, based off the coefficients obtained from regressing historical employment and household data from 1996 to 2011.

The Epping town centre's proximity to the train station greatly enhances its accessibility and potentially the number of jobs locating in the centre. Table 24 below outlines the forecast jobs at 2011 and 2036 for the Epping town centre under this scenario. This scenario differs from other office scenarios, using 2011 as the base year and calculating jobs for the SA2 rather than the town centre.

TABLE 24. EPPING AS SUB-DISTRICT CENTRE –JOBS BY GSC INDUSTRY

	2011	2036
Knowledge Intensive	2,048	3,209
Population Serving	1,559	1,481
Industrial	1,323	1,797
Health and Education	1,582	2,866
Total	**6,512**	**9,353**

Source: SGS, 2017

As with other office floorspace demand scenarios, a standard employment of floorspace ratio of one job per 20 square metres of office floorspace has been applied alongside an attribution rate for centre-based employment by industry. The forecast office floorspace under this scenario is 55,616 at 2036.

TABLE 25. EPPING AS SUB-DISTRICT CENTRE – FLOORSPACE BY GSC INDUSTRY

	2011	2036
Knowledge Intensive	18,691	29,287
Population Serving	6,922	6,576
Industrial	490	665
Health and Education	10,536	19,088
Total	**36,639**	**55,616**

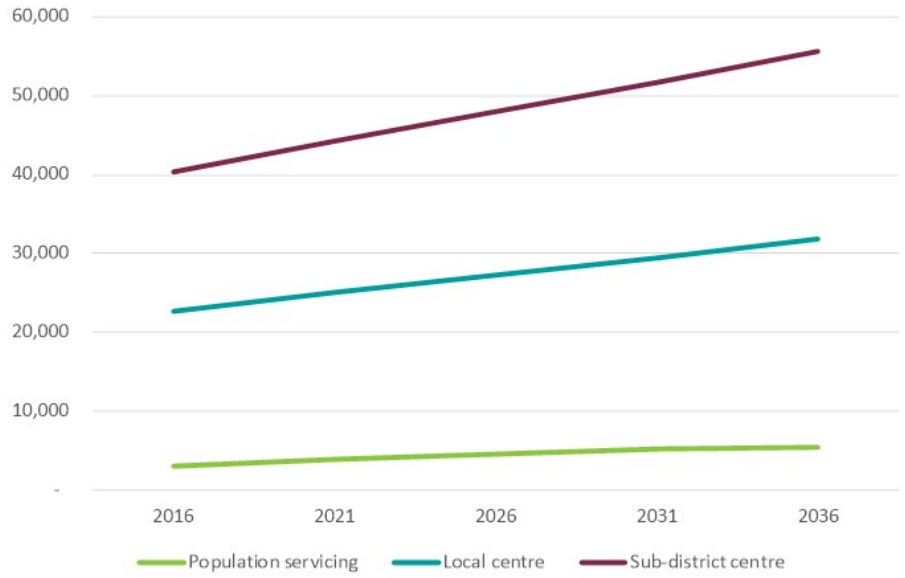
Source: SGS, 2017

However, this scenario requires 2011 as the base scenario. As noted above, the Epping town centre has lost a significant proportion of its office floorspace between 2011 and 2016. This would impact on the employment forecast prepared for the Epping town centre and subsequent floorspace demand. In light of this loss of floorspace, supportable demand for office floorspace of between 40,000 and 45,000 square metres at 2036 is considered more likely.

6.4 Implications for Epping

Three employment scenarios have been forecasted for the Epping town centre. These scenarios act as low, medium and high employment scenarios, dependent on the catchment and role of the Epping town centre. The floorspace supportable under these scenarios are shown in Figure 33.

FIGURE 33. FORECAST OFFICE FLOORSPACE SCENARIOS (SQUARE METRES)



Source: SGS, 2017

The low scenario – Epping as a population serving centre – is not considered realistic or desirable outcome for the Epping town centre. This scenario includes minimal office floorspace for the Epping town centre, relinquishing its current role as a wider services and employment hub. This would remove the potential for local employment as well as limiting the growth of local services, such as medical services, to support the populations beyond the suburb boundaries of Epping.

The medium scenario – Epping as a local centre – forecasts demand for office floorspace in line with current provision in the Epping town centre. Existing office floorspace, both occupied and vacant, would need to be provided within the redevelopment of the Epping Priority Precinct.

The high scenario represents an aspiration for the Epping town centre to function as a sub-District centre. This scenario takes Epping's locational advantages into account.

In light of the competitive offer of Epping, office floorspace demand for Epping is likely to sit between the medium and high scenario. Epping has several beneficial locational and transport attributes, however its proximity to Macquarie Park and the Parramatta CBD limit its ability to function as a strategic employment centre. Supportable demand for office floorspace of between 40,000 and 45,000 square metres at 2036 is considered the most likely limit for office floorspace for Epping if it fulfils a sub-District centre function.

7 IMPLICATIONS AND DIRECTIONS

7.1 The role of Epping town centre

The Epping town centre has been designated as a local centre in State planning documents in the expectation that it will largely accommodate residential development, with minimal retail and commercial floorspace to support the surrounding population.

The analysis of this report suggests that the Epping town centre has the potential to play a more significant role supporting non-residential uses. Epping has a relatively even spread across the GSC's 4 job classification categories. This split of jobs indicates that Epping is an accessible location, attracting jobs in industries that do not necessarily rely on local populations, such as knowledge intensive jobs in professional services.

Consultation with local real estate agents, the Chamber of Commerce, and land owners has found that there is demand for retail and office floorspace in Epping that is not currently being met. A limited supply of office floorspace in particular has also occurred in recent years, impacting on the availability of space for current and future office uses in particular.

Given Epping's close proximity to other strategic centres at the metropolitan level, existing uses and significant infrastructure assets, including access to the new Sydney metro, the role of Epping could therefore be seen as a sub-district centre, which meets the needs of a large local residential population in its immediate catchment as well as providing higher-order services and commercial space for small to medium sized businesses. This idea of Epping as a significant services and small business centre within the West Central District, catering to the diverse needs of residents within its catchment, is consistent with the strategic idea of a '30 minute city' where more employment, opportunities and services are provided within a reasonable travel distance.

If the Epping town centre is considered on its own, demand for an additional 13,000 square metres of retail floorspace is forecast to 2036. However, the Epping town centre forms part of a wider retail system. Some of this forecast demand can be met across other nearby local retailing centres, including Carlingford and Eastwood. The variety of higher order retailing available in Carlingford can complement the hospitality and convenience offering of the Epping town centre. The redevelopment of properties across the Epping town centre has the potential to enhance the variety and built form of retail uses in the centre raised in consultation.

The forecast demand for office floorspace for Epping identified earlier is 55,616 square metres of office floorspace by 2036 if Epping is to fulfil a sub-District centre function. This office floorspace could enable the Epping town centre to function as a secondary employment centre in the local office market, supporting but not competing with the major employment centres of the Parramatta CBD and Macquarie Park. The Epping town centre is likely to support local small and medium enterprises as well as some strategic knowledge intensive businesses requiring smaller floorplates in a highly accessible location.

7.2 Potential approaches

Existing retail floorspace in the Epping town centre is likely to be redeveloped and replaced with ground floor retail floorspace under the existing market conditions and planning controls framework. However, the current planning controls do not promote the provision of commercial floorspace above the ground floor and it is considered that this is likely to continue into the future as the residential market remains strong. Under current market conditions, it is unlikely that the forecast quantum of office floorspace will be provided, with existing floorspace converted to residential uses despite existing DCP controls encouraging non-residential floorspace above the ground floor.

It is therefore considered appropriate to require some commercial floorspace to be included within new development applications and planning proposals There are three general approaches that could be applied to see the delivery of commercial floorspace in the Epping town centre.

Standalone office development

There may be potential for the development of standalone office towers in the Epping town centre. However, the current strength of the residential property market is likely to 'work against' the development of a new standalone office tower as the principal development on a site in the Epping town centre. Given residential floorspace is permissible with consent this is likely to be seen as the 'highest and best use' for most sites across the town centre.

In order to ensure that standalone office towers occur, development controls would need to change to remove the potential for residential development to be the 'highest and best use'. A Commercial Core zoning, prohibiting residential development, would need to be contemplated. This would impact on land value to the detriment of land owners and purchasers who have 'factored in' prospects for residential development. Furthermore, there is no guarantee that stand alone office development would follow as pre-commitments for office floorspace are typically required before construction commences, and there may not be sufficient depth of demand for this to occur. A Commercial Core zoning is therefore not considered appropriate or viable for the Epping town centre in light of the market trends reviewed and should not be relied upon to deliver the office floorspace forecast for Epping as a sub-District centre.

This is not to say that this form of development cannot occur – changes in demand for residential and commercial property may alter demand for this type of development – however it is unlikely to be feasible in the short to medium term. The development of standalone office towers may be possible on larger sites where residential and office buildings could be 'horizontally separated', rather than in vertically separated configurations. This cannot be dictated in planning controls or relied upon to deliver the forecast office floorspace. but remains a possibility for a market-led option in the Epping town centre.

Non-residential floorspace ratio

Ideally, a mixed use shop top housing development would incorporate commercial uses above the ground floor along with residential floorspace. The inclusion of commercial floorspace in podium development at the base of mixed use towers is considered to be the most appropriate and desirable outcome for the Epping town centre

This would be achieved through the application a non-residential floorspace ratio in the new LEP for the Epping town centre. A non-residential floorspace ratio requires a minimum proportion of a development proposal's floorspace to be allocated to non-residential uses. Existing examples in Greater Sydney include the North Sydney and St Leonards strategic centres under the *North Sydney Local Environmental Plan 2012* and the Merrylands local centre under the *Holroyd Local Environmental Plan 2013*.

Development of government owned sites

The development of local and/or state government -owned land may provide an opportunity to deliver office floorspace to meet forecast demand over the next 20 years. The development of government-owned sites has the potential to act as a 'proof of concept', demonstrating the value of providing floorspace to accommodate small to medium enterprises and the development of a truly mixed use centre. Development on these site/s could include residential development. The potential for a shared work space should also be considered to support small office-based enterprises. This would require a deliberate strategy to support the 30 minute city concept with Epping as a hub and a sub-District centre.

The primary opportunity in the Epping town centre is the Ray Road/Beecroft Road sites that have been acquired by the state for the development of the Sydney Metro. These were previously zoned for business purposes (i.e. B2 Local Centre). Notwithstanding the current R4 High Density Residential zoning, these sites provides an opportunity to support the functioning of Epping as a sub-District centre with a true mix of uses, potentially incorporating commercial floorspace on the first few storeys and/or a standalone office tower.

It is recognised that this option is largely outside of Council's control and involves engagement with and support of the NSW government and relevant state agencies which should be sought. Therefore, this approach cannot be relied on to achieve the vision of Epping as a sub-District centre.

7.3 Achieving the vision for Epping as a sub-District centre

A non-residential floorspace ratio is considered the most appropriate and effective mechanism to maintain and develop commercial floorspace in the Epping town centre to meet demand over the next 20 years. This would see the development of truly mixed use development which supports the healthy functioning of the centre, providing services for the local and surrounding population, and enable Epping to capitalise on existing and future transport infrastructure as a sub-District centre. A non-residential floorspace in the LEP would also achieve the podium-style development currently required in the two DCPs with the weight of an environmental planning instrument. Maintaining residential development as part of the development is considered appropriate and viable under current market conditions, ensuring residents are located in the centre to activate the Epping town centre outside of work hours.

The appropriate ratio would be set by Council to meet the forecast demand for 55,616 square metres of office floorspace after considering where in Epping commercial floorspace should apply and what uses should be excluded from a minimum non-residential floorspace ratio.

Existing examples of non-residential floorspace ratios in Greater Sydney exclude all residential accommodation, tourist and visitor accommodation, carparks and telecommunications facilities from calculating non-residential floorspace. The exclusion of these uses is largely considered appropriate for Epping. The exclusion of serviced apartments (a form of tourist and visitor accommodation) is considered necessary too as this land use performs a similar role to residential accommodation and would not assist in achieving the strategic vision for the Epping town centre as a sub-District centre.

The location of a non-residential floorspace ratio should be determined by Council considering the most desirable planning and urban design outcomes. The spread of a non-residential floorspace ratio will affect the size of the ratio required to meet forecast need. For instance, a lower ratio would apply across a larger area whereas a non-residential floorspace ratio that only applies to a few lots would need to be higher to achieve 55,616 square metres of office floorspace.

It is SGS' view that a non-residential floorspace ratio should apply on both sides of the rail line to activate both sides of the rail line. It is recognised that some of this potential has been lost with approved development applications on the eastern side including limited commercial floorspace above the ground floor. There may be more potential to provide more commercial floorspace on the western side of the rail line as the lots are generally larger and there is limited approved redevelopment.

A non-residential floorspace should be supported by design controls in the new DCP to achieve a human-scale streetscape and a high quality public domain. It is envisaged that the existing design controls requiring podium style development will continue, providing space for commercial uses mandated in the non-residential floorspace ratio. DCP controls should also stress the need for developments to include flexible floorspace to accommodate businesses of different sizes as they grow and development.

DCP controls should also explore innovative car parking controls to reduce development costs and the impact of cars on the Epping town centre. These controls could include maximum rates for parking or the reduction of minimum car parking rates, and contributions to offsite, centralised car parking supporting several developments. These controls should recognise the Epping town centre's high quality public transport connections and should be developed in accordance with the findings of the Traffic and Transport report prepared as part of the Epping Planning Review.

8 APPENDIX

8.1 Average Retail Turnover Densities – 2016 estimate

	Turnover p/sqm.
Specialty - Other Food	$14,282
Specialty - Other Food	$12,272
Hospitality and Services	$8,152
Specialty - Other Retail	$8,035
Specialty - Clothing and Soft Goods	$5,756
Department Stores	$5,897
Bulky/Household Goods	$5,613

Source: Urbis (2009) with SGS calculations (2017)

8.2 Allocation of commodity expenditure to floorspace typology

	Food & Groceries	Bottleshop/ Tobacco	Restaurants & Cafes & Take-away	Clothing & Shoes	Furniture, Whitegoods, Homeware, Manchester & Electronics	Hardware & Garden	Other Retail	Retail Services
Supermarkets/ Convenience stores	75%	30%						
Specialty - Other Food	25%	70%					10%	
Specialty - Other Food			100%					
Hospitality and Services								
Specialty - Other Retail					10%	10%	80%	70%
Specialty - Clothing and Soft Goods				70%				
Department Stores				30%	45%		10%	30%
Bulky/Household Goods					45%	90%		

8.3 Retail floorspace pipeline

Note: only development applications that include retail floorspace are included in this table.

Address	Stage	Current use	Proposed retail (sqm.)	Retail details
Eastwood				
3-5 Trewlaney Street	Pre construction	Vacant	564	5 tenancies, ground floor
115 Rowe St	DA approved	Carpark	440	Expansion of Eastwood Hotel. comprising bar/dining areas, alfresco dining and seating areas, bar with outdoor gaming) at ground floor
7-9 Rutledge Street	Pre construction	Vacant	960	Ground floor
13-19 Glen Street	DA assessment	single detached houses	800	4 ground level retail tenancies (90sq m to 298sq m)
Total			**2,764**	
Carlingford				
12 James Street	DA approved	Single detached house	12	Part of mixed use development
1-7 Thallon Street	Construction	Vacant site	408	Part of mixed use development
2-8 James Street	Construction	Vacant site	55	Part of mixed use development
10 James Street	Construction	Vacant site	24	Part of mixed use development
Total			**499**	
Epping				
15-17 Essex Street	Construction	Single detached house (3)	210	Part of mixed use development
20-28 Cambridge Street	Construction	Office tower	1,008	Tenancies are all under 100sqm
12-22 Langston Place	DA assessment	Office tower	1,454	Approx. 10 tenancies
2-4 Cambridge Street	DA assessment	Church	1,474	One large tenancies (approx. 1100sqm, marked as commercial, has ground floor access), one smaller tenancy)
Total			**4,146**	

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Epping Town Centre

Commercial Floorspace Traffic Study

Prepared for City of Parramatta
February 2020

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Epping Town Centre

Commercial Floorspace Traffic Study

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City of Parramatta

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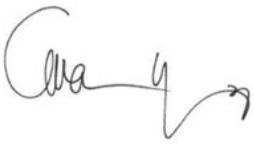

Allan Young
National Technical Leader - Urban & Regional Planning
21 February 2020

Table of Contents

Appendices

Tables

Figures

1 Introduction

1.1 Overview

City of Parramatta (the Council) has engaged EMM Consulting to assess and compare operational traffic results for the major road network based on two future (2026) Town Centre land use scenarios. The future base year scenario and two proposed future land use scenarios are summarised as follows. The relevant areas are illustrated in Figure 1.1 for the core Town Centre Study area (in blue) and the surrounding areas (in orange) which are relevant to the assessments in this traffic study report.

Throughout this report, the following terms are used.

- **Authorised development,** includes approved development (and approved development under construction) for the period from 2016 to 2026 in the Town Centre and surrounding areas in accordance with the current floor space ratio (FSR) planning controls. This equates to approximately 2,017 dwellings (refer to Appendix A).

- **Scenario 0 - base case,** authorised development + 12,232 m^2 retail area + 5,504 m^2 commercial office area + a potential 1,742 residential units based on 85 m^2 unit size (for the purpose of comparability between scenarios) under the current development controls. This scenario identifies the likely development patterns in the absence of any changes to development controls.

- **Scenario 1 - future land use with additional commercial development,** authorised development + 12,232 m^2 retail area + 43,551 m^2 commercial office area + a potential 1,310 residential units based on 85 m^2 unit size (for the purpose of comparability between scenarios). No change to current FSR planning controls. This scenario considers the future development pattern if an increase in commercial floorspace displaces some of the residential floorspace.

- **Scenario 2 - future land use with additional commercial development and revised FSR,** authorised development + 12,232 m^2 retail area + 43,551 m^2 commercial office area + a potential 1,808 residential units based on 85 m^2 unit size (for the purpose of comparability between scenarios). This scenario considers the outcome if the commercial component of future development is increased and an increase in FSR is also introduced which will provide for greater commercial development but without any displacement of residential floorspace.

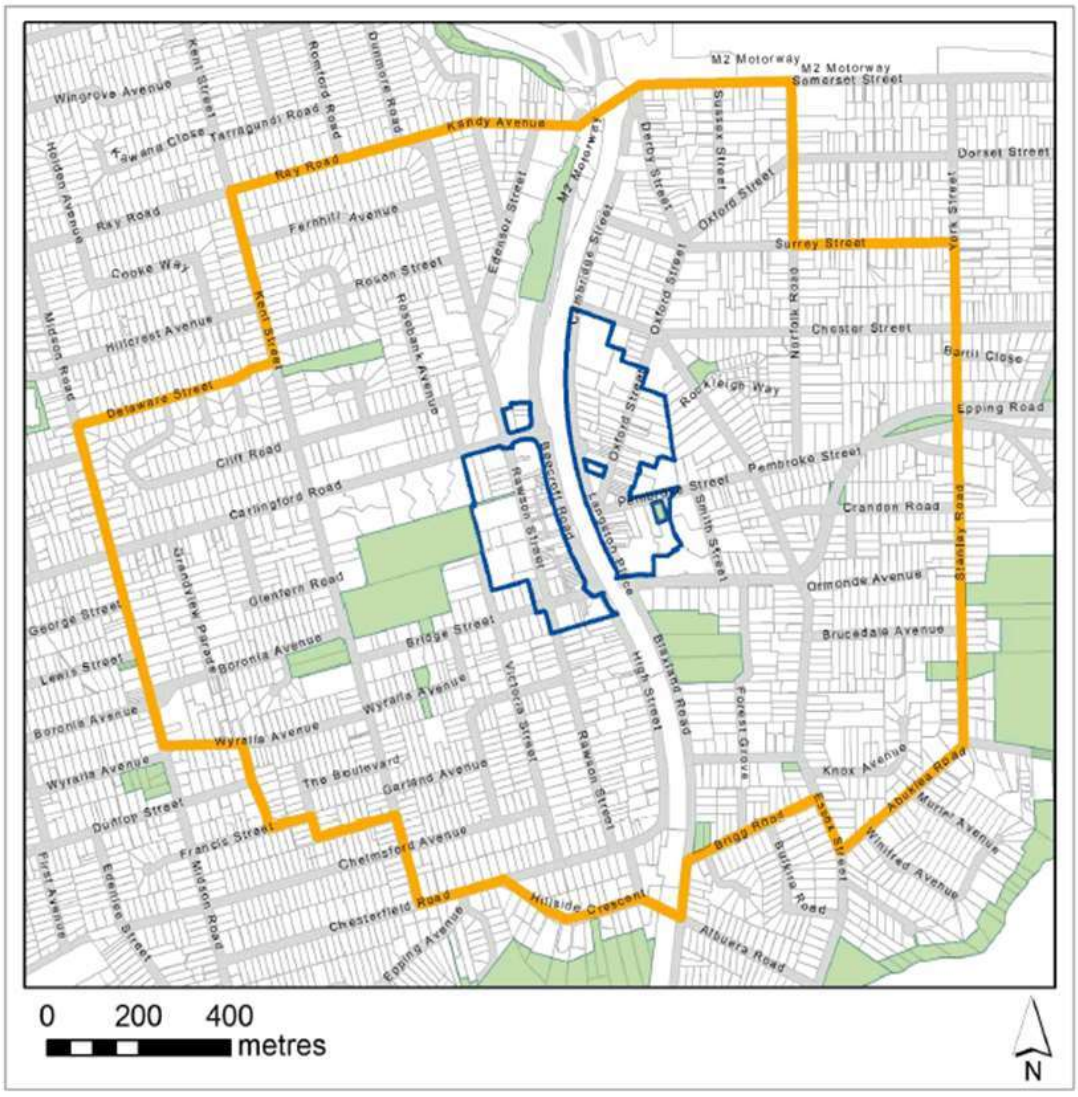

Figure 1.1 Map of the Epping Town Centre and surrounding study areas

1.2 Future base year and proposed future land use scenarios

The Council has provided EMM with a detailed list of properties that are either approved or under construction. These are considered to be 'authorised development' and represent development which is included under all scenarios and summarised at Table 1.1.

The locations of the future study area development sites outside the Town Centre are shown on the map in Appendix A.

The additional Town Centre potential development sites for Scenario 0 (future base year) and Scenario 1 and Scenario 2 (proposed future land uses) are shown in Appendix B.

Table 1.1 Authorised dwelling development within the Town Centre

Property address	Residential Units (@ 85 sqm each)
35 Oxford Street	54
18-28 Cambridge Street	501
30-42 Oxford Street	254
12-22 Langston Place;	464
24-36 Langston Place	101
37-41 Oxford Street	257
48-54 Beecroft Road and 52-54 Rawson Street	130
16-18 Cambridge Street	84
29-33 Oxford Street and 6-14 Cambridge Street (Catholic Church site)	172
Total All Sites	**2,017**

Source: City of Parramatta (2019)

The difference between the scenarios is based on changes to development controls, specifically the allowable commercial area and the FSR.

For the purposes of comparability between the various scenarios, we have assumed a standard residential unit size of 85 m^2 in all tables. Not all residential dwellings will be 85 m^2, but this is considered a reasonable standard for the purposes of this report.

1.2.1 Scenario 0: future base case

Scenario 0 is the base case for 2026, where the majority of authorised and future potential development is residential, with minimal commercial development. The majority of dwellings in the base case 2026 Scenario are located on sites within the core Epping Town Centre study area, which is shown in blue outline in Figure 1.1.

These sites are zoned B2 Local Centre under the Parramatta Local Environmental Plan 2011. These dwellings comprise 2,017 dwellings of 'authorised development' which are listed in Table 1.1, and a further potential 1,742 dwellings which are listed in Table 1.2. A further 1,334 dwellings are distributed in the area outside Epping Town Centre within the orange outline area in Figure 1.1. Under this scenario, there is also approximately 5,504 m2 of office gross floor area.

Table 1.2 Additional development within the Town Centre (Scenario 0)

Property address	Scenario 0	
	Residential Units (85 m^2)	Commercial Office GFA (m^2)
1-3 Oxford Street	0	0
18-24 Oxford Street	67	0
26-28 Oxford Street	34	0
50-50E Rawson Street; part 9 Bridge Street	91	0
41-47 Beecroft Road	99	0

Table 1.2 Additional development within the Town Centre (Scenario 0)

Property address	Scenario 0	
	Residential Units (85 m²)	Commercial Office GFA (m²)
51 Rawson Street	63	3,168
51A Rawson Street	372	0
36-38 Victoria Street	0	0
246-250 Carlingford Road	143	0
74-76 Rawson Street	0	2,336
53-61 Rawson Street	460	0
Lyon Site	413	0
All Sites	**1,742**	**5,504**

Source: City of Parramatta (2019)

1.2.2 Scenarios 1 and 2: Proposed future land use

Scenarios 1 and 2 are development scenarios for 2026. Both Scenarios include authorised development of 2,017 dwellings (listed in Table 1.3 and within the blue outline in Figure 1.1). For both Scenarios, a further 1,334 dwellings are distributed in the area outside Epping Town Centre within the orange outline area in Figure 1.1.

Scenario 1 represents a future potential development within the Epping Town Centre (within the blue outline in Figure 1.1) which assumes the development is:

1) consistent with the maximum floor space ratio controls within the Parramatta Local Environmental Plan (LEP) 2011 and Hornsby LEP 2013; and

2) comprise a minimum of two levels of commercial (office) floorspace within the development.

This totals 1,310 additional dwellings and approximately 43,551 m² of office gross floor area. The sites of potential development are listed in Table 1.3.

Scenario 2 represents a future potential development within the Epping Town Centre (within the blue outline in Figure 1.1) which assumes that development comprises a minimum of 2 levels of commercial (office) floorspace within the development which exceeds the current maximum floor space ratio controls within the Parramatta LEP 2011 and Hornsby LEP 2013. This totals 1,808 additional dwellings and approximately 43,551 m² of office gross floor area. The sites of potential development are listed in Table 1.3.

Table 1.3 Proposed future development within the Town Centre (Scenario 1 and Scenario 2)

Property address	Scenario 1		Scenario 2	
	Residential Units (@ 85 m² each)	Commercial Office GFA (m²)	Residential Units (@ 85 m² each)	Commercial Office GFA (m²)
1-3 Oxford Street	0	0	0	0
18-24 Oxford Street	46	1,888	67	1,888
26-28 Oxford Street	24	960	34	960

Table 1.3 Proposed future development within the Town Centre (Scenario 1 and Scenario 2)

Property address	Scenario 1		Scenario 2	
	Residential Units (@ 85 m² each)	Commercial Office GFA (m²)	Residential Units (@ 85 m² each)	Commercial Office GFA (m²)
50-50E Rawson Street;part 9 Bridge Street	63	2,032	91	2,032
41-47 Beecroft Road	71	2,254	99	2,254
51 Rawson Street	63	3,168	104	3,168
51A Rawson Street	294	6,666	372	6,666
36-38 Victoria Street	0	0	0	0
246-250 Carlingford Road	93	4,816	152	4,816
74-76 Rawson Street	0	2,336	0	2,336
53-61 Rawson Street	339	9,634	460	9,634
Lyon Site	318	9,797	429	9,797
All Sites	**1,310**	**43,551**	**1,808**	**43,551**

Source: City of Parramatta (2019)

1.3 Methodology

EMM Consulting engaged a Transport Modelling Specialist, Paul van Den Bos, to conduct the required major road network and intersection modelling analysis for the base year 2026 (Scenario 0) and the two proposed future 2026 land use scenarios (Scenario 1 and Scenario 2) to identify the additional peak hourly traffic volumes using the road network at each intersection and the mid-block traffic flow speeds and traffic queues (vehicles waiting) between each intersection.

In comparison to the historic Epping Town Centre major road network operations, where the peak period traffic volumes were initially surveyed in 2017 to develop the original baseline traffic network models for this study, a number of recent road network improvements (which have now either been completed since 2017, or their future construction timetable is now known) are included in all the 2026 road network traffic model scenarios which have been analysed. These road network improvements are listed in Table 1.4.

Table 1.4 Summary of committed RMS and Council road improvements

Number	Authority	Proposed road works
1	RMS	Additional capacity at the Beecroft Road and Carlingford Road intersection.
2	RMS	Widening the southern side of Epping Road by about 3.7 metres between Blaxland Road and Essex Street to provide an additional westbound lane.
3	RMS	Widening of railway bridge, additional westbound lane into Beecroft Road.
4	Council/RMS	Signalisation of Kent Street/Carlingford Road intersection.

Two levels of road network traffic modelling have been undertaken for this study using the Dynameq and SIDRA-8 road network and linked intersection traffic models.

Both these models are "mesoscopic" type road network models which take the basic road network output volumes from a regional traffic network model (in this case EMME/2) and use a more detailed "linked intersection" traffic

flow and congestion model to identify specific road network performance outputs (eg travel speed and intersection delays) and the number of vehicles which cannot actually enter the road network when 'gridlock' traffic congestion occurs.

In the case of the Dynameq network model, the model was developed for the morning three-hour peak traffic period only and provided detailed outputs for the following road network operations:

- traffic volume demand, vehicles entering the road network at 15-minute intervals from 6:45 am;
- traffic volume throughput, vehicles exiting the road network at 15-minute intervals from 6:45 am;
- suppressed traffic, vehicles "waiting" to enter the road network at 15-minute intervals from 6:45 am, and
- traffic travel speeds eastbound through the road network at 15-minute intervals from 6:45 am.

In the case of the SIDRA network model, the model was developed for the morning and afternoon one-hour peak traffic periods and provided detailed outputs for the following road network operations for each of the seven major 'traffic signal controlled' intersections along the Epping Town Centre east-west through traffic route:

- overall network traffic volume, level of service and average travel speed;
- intersection peak hourly traffic volume demand and throughput (minus suppressed traffic);
- intersection peak hourly traffic degree of saturation;
- intersection peak hourly average traffic delay (seconds) for all vehicles using the intersection;
- intersection peak hourly level of service within the range ABCDEF which is defined according to RMS standards; and
- maximum peak hour (95^{th} percentile) traffic queue length (metres).

2 Traffic generation assumptions

2.1 Traffic generation rates

Traffic generation assumptions used in this study report are based on the RMS *Guide to Traffic Generating Developments* (RTA 2002) including the Technical Direction (TDT 2013 – 04a) updated surveys of August 2013.

The lowest peak hour vehicle trip generation rates for high density residential flat buildings in metropolitan regional (CBD) centres is now in the range 0.15 to 0.19 per unit. In other more suburban traditional medium density developments, the peak hour vehicle trip ratio is approximately 0.48 trips per unit. Traffic generation rates used in the traffic analysis network model for this study report for residential land use (ie primarily high density residential flat buildings in the core Epping Town centre area) are modified versions of the historic RTA-RMS rates adjusted according to the direct line distance from the Epping train station. They are:

- sector 1: 0 – 200 m to train station;
- sector 2: 200 – 400 m to train station;
- sector 3: 400 – 800 m to train station; and
- sector 4: 800 m or more to train station.

Within the core Epping Town Centre study area, the effective traffic generation rate per 100 sqm gross floor area for residential apartments would be approximately 0.22 AM and 0.18 PM peak hour car trips (Average 0.20).

For the same given amounts of future building gross floor area within the core Epping Town Centre study area (within 200m of the train station) the future commercial office/retail uses will generally have significantly higher car traffic generation rates than for residential uses as follows:

- The highest car traffic generation rates will generally occur with new town centre retail uses which will have approximately 0.80 AM and 2.30 PM peak hour car trips per 100 sqm (Average 1.55) which is approximately 7.75 times higher than for residential uses.
- Mid range traffic generation rates would typically occur for commercial office type uses which would be approximately 0.80 AM and 0.60 PM peak hour car trips per 100 sqm (Average 0.70). This is approximately 3.5 times higher than for residential uses. These rates are significantly lower than the historic standard RTA or RMS traffic generation rates for office development in suburban areas, which are 2.0 vehicle trips per 100 sqm in both the AM and PM peak hours.
- The commercial office traffic generation rates represent 'best practice' highest feasible levels of walking cycling and public transport usage for journeys to work and visitor access and corresponding minimum feasible level of car driver journey to work travel for any areas outside the Sydney CBD, which are currently approximately 25-30% in any comparable area.

The corresponding morning and afternoon peak hour vehicle trips per hour generated by each land use considered in the study for the core Town Centre and surrounding areas, are summarised in Table 2.1.

Table 2.1 Traffic generation rate adopted in the study report

Sector	AM peak traffic generation per unit							PM peak traffic generation per unit						
	Per sector	Residential land use generated traffic ratio		Commercial land use generated traffic ratio		Retail land use generated traffic ratio		Per sector	Residential land use generated traffic ratio		Commercial land use generated traffic ratio		Retail land use generated traffic ratio	
		80% outbound	20% inbound	20% outbound	80% inbound	20% outbound	80% inbound		40% outbound	60% inbound	80% outbound	20% inbound	50% outbound	50% inbound
Sector 1	0.19	0.152	0.06	0.16	0.64	0.16	0.64	0.15	0.06	0.09	0.48	0.12	1.15	1.15
Sector 2	0.23	0.184	0.092					0.23	0.092	0.138				
Sector 3	0.29	0.232	0.116					0.29	0.116	0.174				
Sector 4	0.48	0.384	0.192					0.48	0.192	0.288				

2.2 Traffic distribution pattern

It is assumed in the network traffic model future traffic distributions, particularly for the future commercial centre office and retail land use generated traffic movements, that the majority of the additional future traffic movements will be approaching the Epping Town Centre via the following routes:

- from north of Epping Town Centre: via Kent Street, Ray Road and Rawson Street;
- from west of Epping Town Centre: via Kent Street, Carlingford Road and Bridge Street;
- from south of Epping Town Centre: via Epping Avenue, Chesterfield Road and Rawson Street; and
- from east of Epping Town Centre: via Epping Road, Oxford Road, Pembroke Street, Blaxland Road and Beecroft Road.

These traffic distribution patterns for the additional Epping Town Centre retail and commercial traffic correspond to the existing retail and commercial traffic generation patterns for all sites within the western and the eastern parts of the Epping Town Centre (as divided by the railway line) which are an inbuilt assumption within the current RMS-TfNSW EMME/2 network traffic model.

These traffic distributions as shown in the attached plots in Figure 2.1 and Figure 2.2, show that the majority of the retail and commercial traffic movements which are currently accessing the areas of the Town Centre on each side of the railway line, will predominantly remain on that side of the railway line.

Figure 2.1 Commercial and retail trip origins for Epping Town Centre areas west of the railway line

Figure 2.2 Commercial and retail trip origins for Epping Town Centre areas east of the railway line

3 Future Road Network Operations

3.1 Dynameq network traffic model results

The Dynameq road network model was developed for both the morning and afternoon three-hour traffic peak periods. The detailed network traffic demand inputs and outputs from the source EMME2 model to the Dynameq network model are shown in Appendix C.

The Dynameq road network morning and afternoon peak period traffic demand which is trying to enter the road network is shown for 15-minute intervals in the various output plots in Appendix C, for the three separate 2026 land use scenarios which have been analysed, which are effectively:

- Scenario 0 = +5,093 additional dwellings in 2026, in comparison to the approximate year 2016 baseline traffic model conditions;
- Scenario 1 = +4,661 additional dwellings and +38,047 m^2 additional GFA commercial development floor area in comparison to the approximate year 2016 baseline traffic model conditions, and
- Scenario 2 = +5,159 additional dwellings and +38,047 m^2 additional GFA commercial development floor area in comparison to the approximate year 2016 baseline traffic model conditions.

In terms of the overall road network traffic demand input and output volumes, calculated for 15-minute intervals, the Dynameq traffic model output plots in Appendix C show that the future road network travel conditions will vary significantly within both the three-hour morning and afternoon peak traffic periods, and the levels of road network traffic congestion, travel time delays, and numbers of vehicles waiting to access the road network, will all continue to increase steadily over the full three-hour morning and afternoon peak traffic periods.

The Dynameq traffic delay results are more significant for the morning peak and these results show that in terms of overall traffic volumes entering the road network, the major road network will reach saturation relatively early in the three-hour morning peak period as follows:

- at approximately 7:45 am for the 2026 baseline traffic (Scenario 0);
- at approximately 7:15 am for the 2026 additional development traffic (Scenario 1); and
- at approximately 7:00 am for the 2026 additional development traffic (Scenario 2).

These results confirm the general effect of the additional development traffic which would be generated by the additional Town Centre development land use scenarios (Scenario 1 and Scenario 2), which would effectively cause the onset of peak traffic congestion to occur significantly earlier each morning and with more severe consequences, in terms of traffic movements blocked, in comparison to the assessed year 2026 baseline (Scenario 0) traffic conditions.

In comparison during the afternoon peak traffic period the differences will be much less noticeable in terms of the divergence of the network traffic congestion levels and peak hour traffic speeds for the three Scenarios and there would be generally much lower numbers of vehicles blocked from entering the Epping Town Centre road network, with either the assessed year 2026 baseline (Scenario 0) traffic conditions or the additional Town Centre development land use scenarios (Scenario 1 and Scenario 2).

The overall net effect of the resulting additional road network traffic congestion during the full three-hour morning peak period for the three development traffic scenarios is shown by the final charts of the Dynameq output traffic model results in Appendix C.

These results show the three assessed land use scenarios having overall network travel speeds which continue to decline throughout the three-hour morning peak travel periods and reaching the following respective minimum values at approximately 8:45 am:

- 8 km/h for the 2026 baseline (Scenario 0);
- 3 km/h for the 2026 additional development (Scenario 1); and
- 2 km/h for the 2026 additional development (Scenario 2).

In comparison the results for the three assessed land use scenarios for the three-hour afternoon peak travel periods show much less effect from either development scenario with the overall network travel speeds reaching the following respective minimum values at approximately 4:00 pm:

- 31 km/h for the 2026 baseline (Scenario 0);
- 31 km/h for the 2026 additional development (Scenario 1); and
- 30 km/h for the 2026 additional development (Scenario 2).

3.2 SIDRA network model results

The SIDRA network travel model results, which are included in Appendix D, are based on a one-hour peak period traffic analysis only and show similar trends to the Dynameq travel model results in terms of the overall network traffic operations for the three land use scenarios. In addition to the individual SIDRA intersection performance results for each of the seven major traffic signal-controlled intersections in the study area, the SIDRA network model also determines the overall network performance Level of Service (LOS) and average travel speed for each assessed traffic scenario.

The Epping Town Centre study area SIDRA traffic model shows the overall road network traffic congestion is lower and the network travel speeds are much higher in the afternoon peak hour compared to the morning peak hour. The morning traffic peak period is clearly the more critical of the two peak hour periods for major road intersection delays and other traffic congestion issues for traffic travelling on and traffic requiring access to the major road networks in the Epping Town Centre study area. The overall major road network average travel speeds for each of the assessed traffic scenarios are as follows:

- In the actual morning peak hour, the future overall network travel speeds will reduce from 9.4 km/h for the baseline (Scenario 0) land use to 9.3 km/h and 8.8 km/h with the future land uses of Scenarios 1 and 2.
- The equivalent SIDRA network level travel speed results in the actual afternoon peak hour show the future overall network travel speeds will reduce from 19.3 km/h for the baseline (Scenario 0) land use to 17.8 km/h and 17.4 km/h with the future land uses of Scenarios 1 and 2.

The significance of these overall SIDRA "network performance" travel speed results should also be considered in the context of the additional SIDRA traffic performance results for the seven individual intersections, which are summarised in further detail in Chapters 4, 5 and 6 of this report.

4 Network operational results for base year Scenario 0

The key finding of the 2026 SIDRA base year network model (Scenario 0) is that during the morning peak hour, the overall network performance will be LOS F with an average travel speed 9.4 km/h. The SIDRA intersection results for the future base year 2026 Scenario 0 operations are shown in Table 4.1. Four of the seven key traffic signal-controlled intersections will be operating at LOS F during the morning peak hour.

Table 4.1 Seven key traffic signal-controlled intersections for Scenario 0 during AM peak hour

Intersection	Vehicle demand	Supressed traffic[1]	Degree of saturation (DOS)	Average delay (seconds) (DEL)	Level of service (LOS)
Carlingford Road/Midson Road	2,968	81	1.335	379.8	F
Carlingford Road/Kent Street	2,837	421	0.802	18.2	B
Carlingford Road/Ray Road/Rawson Street	3,386	387	4.802	706.6	F
Carlingford Road/Beecroft Road	4,671	552	1.294	92.1	F
Epping Road/Blaxland Road/Langston Place	4,770	534	1.103	38.6	C
Epping Road/Essex Street	3,720	314	1.127	91.3	F
Epping Road/Pembroke Street	2,953	293	0.879	13.9	A

Note: 1. Hourly volume of suppressed traffic (suppressed at upstream intersections.

In the 2026 afternoon peak hour, the overall baseline network performance will be LOS D with travel speed 19.3 km/h. The SIDRA results for the baseline land use Scenario 0 traffic operations at the seven key traffic signal-controlled intersections are shown in Table 4.2. Only one intersection (Carlingford Road/Beecroft Road) will be operating at LOS F during the afternoon peak hour for Scenario 0.

Table 4.2 Seven key traffic signal-controlled intersections for Scenario 0 during PM peak hour

Intersection	Vehicle demand	Supressed traffic[1]	Degree of saturation (DOS)	Average delay (seconds) (DEL)	Level of service (LOS)
Carlingford Road/Midson Road	2,778	144	0.849	35.1	C
Carlingford Road/Kent Street	2,477	68	0.608	20.1	B
Carlingford Road/Ray Road/Rawson Street	2,815	189	0.901	25.0	B
Carlingford Road/Beecroft Road	4,065	0	2.344	241.6	F
Epping Road/Blaxland Road/Langston Place	4,294	0	1.132	43.3	D
Epping Road/Essex Street	3,266	0	0.931	36.2	C
Epping Road/Pembroke Street	2,302	0	0.907	13.0	A

Note: 1. Hourly volume of suppressed traffic (suppressed at upstream intersections.

The main reason for the better 2026 baseline traffic network performance in the afternoon peak is that the main RMS improvement (the extra lane westbound on the Epping Bridge) will have its greatest benefit in the afternoon peak hour and there will correspondingly be only one intersection operating at LOS F in the afternoon peak hour, at Carlingford Road/Beecroft Road, with an average traffic delay of 241.6 seconds.

This delay will nevertheless cause some afternoon peak hour traffic suppression at the three other downstream intersections for the main (westbound) traffic flow, which are at Carlingford Road/Ray Road/Rawson Street, Carlingford Road/Kent Street and Carlingford Road/Midson Road.

In contrast during the morning traffic peak hour, the much high number of intersections operating at LOS F, with much higher average traffic delays (up to 706.6 seconds) means that there will be more significant morning peak hour traffic suppression at all the major traffic signal controlled intersections in the road network along the main eastbound through traffic route from, Midson Road to Pembroke Street.

5 Network operational results for Scenario 1

The comparative findings of the 2026 SIDRA network model for Scenario 1 are that during the morning peak hour, the overall network performance will also be LOS F and the average travel speed will reduce from 9.4 km/h to 9.3 km/h. The Forecast SIDRA intersection performance for the seven key traffic signal-controlled intersections are shown in Table 5.1. Two intersections will experience a change in level of service, which is shown in **bold**.

Table 5.1 Seven key traffic signal-controlled intersections for Scenario 1 during AM peak hour

Intersection	Vehicle demand	Supressed traffic[1]	Degree of saturation (DOS)	Average delay (seconds) (DEL)	Level of service (LOS)
Carlingford Road/Midson Road	3,034	101	1.229	262.9	F
Carlingford Road/Kent Street	2,888	374	0.858	20.9	B
Carlingford Road/Ray Road/Rawson Street	3,478	355	5.392	765.9	F
Carlingford Road/Beecroft Road	4,698	500	1.383	109.9	F
Epping Road/Blaxland Road/Langston Place	**4,816**	**489**	**1.186**	**45.8**	**D**
Epping Road/Essex Street	3,747	275	1.144	109.0	F
Epping Road/Pembroke Street	**2,963**	**269**	**0.916**	**16.7**	**B**

Note: 1. Hourly volume of suppressed traffic (suppressed at upstream intersections.

In the 2026 afternoon peak hour for Scenario 1, the future network traffic performance will be LOS E with travel speed reduced from 19.3 km/h to 17.8 km/h. The SIDRA results for the 2026 Scenario 1 intersection operations at the seven key traffic signal-controlled intersections which are shown in Table 5.2 show no Intersections will experience any change in the level of service.

Table 5.2 Seven key traffic signal-controlled intersections for Scenario 1 during PM peak hour

Intersection	Vehicle demand	Supressed traffic[1]	Degree of saturation (DOS)	Average delay (seconds) (DEL)	Level of service (LOS)
Carlingford Road/Midson Road	2,796	154	0.859	35.2	C
Carlingford Road/Kent Street	2,503	179	0.607	19.8	B
Carlingford Road/Ray Road/Rawson Street	2,883	204	0.868	26.3	B
Carlingford Road/Beecroft Road	4,094	0	2.567	278.6	F
Epping Road/Blaxland Road/Langston Place	4,325	0	1.264	54.0	D
Epping Road/Essex Street	3,289	0	0.908	36.1	C
Epping Road/Pembroke Street	2,307	0	0.907	12.8	A

Note: 1. Hourly volume of suppressed traffic (suppressed at upstream intersections.

During the future morning peak hour for Scenario 1, two of the seven key traffic signal-controlled intersections will experience a change in the level of service, but this will have only a relatively minor effect on the overall network traffic operations as the respective level of service changes are from C to D at the Epping Road/Blaxland Road/Langston Place intersection and from A to B at the Epping Road and Pembroke Street intersection.

The four existing intersections where the morning peak hour traffic conditions are at LOS F under the year 2026 baseline land use 0 traffic scenario, will remain at LOS F under the year 2026 development land use 1 traffic scenario.

During the future afternoon peak hour for Scenario 1, there will be no change to the level of service operations at any of the seven key traffic signal-controlled intersections.

6 Network operational results for Scenario 2

The year 2026 SIDRA network model results for land use Scenario 2 show that during the morning peak hour, the overall network performance is still LOS F with average travel speed reducing marginally from a baseline of 9.4 km/h to 8.8 km/h. The SIDRA network operations results for the 2026 Scenario 2 traffic delays at the seven key traffic signal-controlled intersections are shown in Table 6.1.Two intersections will experience a change in level of service, which is shown in **bold.**

Table 6.1 Seven key traffic signal-controlled intersections for Scenario 2 during AM peak hour

Intersection	Vehicle demand	Supressed traffic[1]	Degree of saturation (DOS)	Average delay (seconds) (DEL)	Level of service (LOS)
Carlingford Road/Midson Road	3,045	103	1.232	266.4	F
Carlingford Road/Kent Street	2,905	381	0.859	20.5	B
Carlingford Road/Ray Road/Rawson Street	3,526	358	5.647	840.8	F
Carlingford Road/Beecroft Road	4,721	531	1.387	109.5	F
Epping Road/Blaxland Road/Langston Place	**4,840**	**520**	**1.193**	**50.5**	**D**
Epping Road/Essex Street	3,763	295	1.147	111.0	F
Epping Road/Pembroke Street	**2,971**	**287**	**0.916**	**16.7**	**B**

Note: 1. Hourly volume of suppressed traffic (suppressed at upstream intersections.

In the 2026 afternoon peak hour results for Scenario 2, the overall network performance is LOS E with travel speed reducing from a baseline of 19.3 km/h to 17.4 km/h. The SIDRA results at the seven key traffic signal-controlled intersections are shown in Table 6.2. No intersection will experience a change in the level of service.

Table 6.2 Seven key traffic signal-controlled intersections for Scenario 2 during PM peak hour

Intersection	Vehicle demand	Supressed traffic[1]	Degree of saturation (DOS)	Average delay (seconds) (DEL)	Level of service (LOS)
Carlingford Road/Midson Road	2,802	158	0.859	35.2	C
Carlingford Road/Kent Street	2,515	210	0.597	18.8	B
Carlingford Road/Ray Road/Rawson Street	2,910	209	0.876	27.1	B
Carlingford Road/Beecroft Road	4,103	0	2.635	291.1	F
Epping Road/Blaxland Road/Langston Place	4,342	0	1.270	54.7	D
Epping Road/Essex Street	3,298	0	0.885	35.4	C
Epping Road/Pembroke Street	2,310	0	0.907	12.9	A

Note: 1. Hourly volume of suppressed traffic (suppressed at upstream intersections.

Similar to the results for Scenario 1, the year 2026 afternoon peak hour traffic conditions for Scenario 2 will see no change to the level of service operations at any of the seven key traffic signal-controlled intersections considered.

During the future morning peak hours for Scenario 2, two of the seven key traffic signal-controlled intersections will experience a change in the level of service (Similarly to the results for Scenario 1), but this will have only a relatively minor effect on the overall network traffic operations as the respective intersection level of service changes are from LOS C to D at the Epping Road/Blaxland Road/Langston Place intersection and from LOS A to B at the Epping Road and Pembroke Street intersection.

However as four of the existing intersections will have morning peak hour traffic conditions at LOS F under all the three year 2026 land use traffic scenarios considered, it would be appropriate for the Council to seek to minimise the future vehicular traffic generated by future residential or commercial development in the core Epping Town Centre area, during the future morning peak hour traffic periods. The future Town Centre vehicular traffic congestion and accessibility constraints would be less significant during the future afternoon peak hour traffic periods.

7 Comparison and conclusion

In comparison to the base year 2026 traffic conditions for Scenario 0, both the new Commercial + Residential land use scenarios (Scenarios 1 and 2) are showing some increased traffic volumes (and traffic impacts).

However these additional traffic impacts are in most cases relatively minor (in particular for land use Scenario 1) as there will be only minor traffic delay changes at the four existing intersections which will already be operating at highly congested traffic operating conditions during the future year 2026 baseline traffic conditions, during the morning peak hour.

The summary comparison of the future Scenario 1 and Scenario 2 forecast intersection traffic operations relative to Scenario 0 is shown in Table 7.1 for the morning peak hour and in Table 7.2 for the afternoon peak hour. Changes to LOS are shown in **bold** and existing LOS F congested intersection operations are highlighted in grey.

Table 7.1 Comparison of SIDRA traffic impact for various scenarios during the AM peak hour

Intersection	Scenario 0			Scenario 1			Scenario2		
	DOS	DEL	LOS	DOS	DEL	LOS	DOS	DEL	LOS
Carlingford Road/Midson Road	1.335	379.8	F	1.229	262.9	F	1.232	266.4	F
Carlingford Road/Kent Street	0.802	18.2	B	0.858	20.9	B	0.859	20.5	B
Carlingford Road/Ray Road/Rawson Street	4.802	706.6	F	5.392	765.9	F	5.647	840.8	F
Carlingford Road/Beecroft Road	1.294	92.1	F	1.383	109.9	F	1.387	109.5	F
Epping Road/Blaxland Road/Langston Place	1.103	38.6	C	**1.186**	**45.8**	**D**	**1.193**	**50.5**	**D**
Epping Road/Essex Street	1.127	91.3	F	1.144	109.0	F	1.147	111.0	F
Epping Road/Pembroke Street	0.879	13.9	A	**0.916**	**16.7**	**B**	**0.916**	**16.7**	**B**

Note: DOS = Degree of Saturation, DEL = Average Vehicle Delay (seconds), LOS = Level of Service

Table 7.2 Comparison of SIDRA traffic impact for various scenarios during the PM peak hour

Intersection	Scenario 0			Scenario 1			Scenario 2		
	DOS	DEL	LOS	DOS	DEL	LOS	DOS	DEL	LOS
Carlingford Road/Midson Road	0.849	35.1	C	0.859	35.2	C	0.859	35.2	C
Carlingford Road/Kent Street	0.608	20.1	B	0.607	19.8	B	0.597	18.8	B
Carlingford Road/Ray Road/Rawson Street	0.901	25.0	B	0.868	26.3	B	0.876	27.1	B
Carlingford Road/Beecroft Road	2.344	241.6	F	2.567	278.6	F	2.635	291.1	F
Epping Road/Blaxland Road/Langston Place	1.132	43.3	D	1.264	54.0	D	1.270	54.7	D
Epping Road/Essex Street	0.931	36.2	C	0.908	36.1	C	0.885	35.4	C
Epping Road/Pembroke Street	0.907	13.0	A	0.907	12.8	A	0.907	12.9	A

Note: DOS = Degree of Saturation, DEL = Average Vehicle Delay (seconds), LOS = Level of Service

In the morning peak hour, under the future baseline (Scenario 0) traffic conditions, four of the Epping study area intersections will already be operating at highly congested traffic conditions (Level of Service F), in particularly the most congested intersection, which is at Carlingford Road/Ray Road/Rawson Street.

However as this intersection will effectively be operating at delays approximately ten times higher than the specified average traffic delay threshold limit, which is 70 seconds, for LOS F, the effect of the further significant increase in delay by 60 and 135 seconds respectively for Scenario 1 and Scenario 2 may not actually be that noticeable as the future delays will increase from ten to either eleven or twelve times the minimum delay threshold limit for LOS F. Although still a potentially significant delay increase in actual terms, in proportional terms the additional delay increase may not be particularly noticeable to most road users.

However as two of the seven intersections, which are not currently operating at LOS F will also experience changes to the level of service (Epping Road/Blaxland Road/Langston and Epping Road/Pembroke Street) there will effectively be a significant overall worsening of the future baseline traffic conditions and traffic delays at all the assessed future Epping Town Centre intersections for the future increased residential and commercial development scenarios (Scenario 1 and Scenario 2) in comparison to Scenario 0.

In comparison, during the future afternoon peak hour assessed traffic conditions for Scenario 1 and Scenario 2, as summarised in Table 7.2, there will be much less noticeable changes to the future traffic delays at the seven assessed intersections will see no significant material change to the future intersection operations under Scenario 1 and Scenario 2, compared to the future baseline Scenario 0. At the one intersection (Carlingford Road/Beecroft Road) which will be operating at over capacity traffic conditions (LOS F) under the future baseline Scenario 0, there will be further average delay increases of 37 and 49.5 seconds respectively for Scenario 1 and Scenario 2, which may be considered a significant further worsening of the assessed future baseline intersection traffic delay of 241.6 seconds, but this is only a potentially significant impact at one intersection

In general, during the assessed future afternoon peak hour traffic conditions, the overall network travel speeds intersection performance are much better than during the morning peak hour, which is believed to be primarily a result of the assumed future Epping Bridge widening, which is only by a single lane and in the westbound direction only. This assumed future widening will therefore primarily only relieve the existing afternoon peak hour (westbound) traffic delays and will do little to improve the current morning peak hour traffic congestion.

Consequently the future Epping morning peak hour traffic conditions will be much more susceptible and vulnerable to additional traffic delay increases as a result of increased town centre development (either residential, commercial office or retail uses) in comparison to the future Epping afternoon peak hour traffic conditions.

Appendix A

Baseline residential sites


TZ 1403
TZ 1406
Model zone
TZ 1404
TZ 1408
Outside - Productions AM
Outside - Attractions AM
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Appendix B

Proposed commercial site details

BASE CASE - GROUND FLOOR RETAIL -+ RESIDENTIAL TOWER ABOVE

	Address	FSR	HOB	Site Area	Podium Footprint	Retail GFA (35%)	Comm. 2 levels GFA (80%)	Res. Footprint	Storeys	Res. GFA (75%)	Units (85sqm)	Total GFA	FSR	Height [(retail4.5m) + (res storeys x 3.1m)]
A1	1-3 Oxford	4.5	48	990	strata	300								
C1	18-24 Oxford Street	4.5	48	1350	1180	413	0	585	13	5704	67	6117	4.5	44.8
C2	26-28 Oxford Street	4.5	48	700	600	210	0	226	17	2882	34	3092	4.4	57.2
F	30-30A Rawson Street & part 9 Bridge Street	6	72	1370	1270	445	0	355	29	7721	91	8166	6.0	94.4
I	41-47 Beecroft Road	6	72	1475	1409	493	0	450	25	8438	99	8931	6.1	82
M	51 Rawson Street	4.5	48	2060	1980	693	3168	789	9	5326	63	9187	4.5	39.9
N	51A Rawson Street	4.5	48	7445		2083	0	2220	19	31635	372	33718	4.5	2+ towers
Q	36-38 Victoria Street	4.5	48	4465	strata	0	0			0	0	0		
R	246-250 Carlingford Road	4.5	48	3010	3010	1054	0	955	17	12176	143	13230	4.4	57.2
S	74-76 Rawson St	6	72	4141	strata	1061	2336							
T	53 -61 Rawson Street	4.5	48	9021	6021	2107	0	2745	19	39116	460	41224	4.6	2+ towers
V	Lyon Site	6	72	6584	6123	3674	0	1800	26	35100	413	38774	5.9	2 towers
	Total					12232	5504			148097	1742	162437		

SCENARIO 1 - GROUND FLOOR RETAIL + 2 LEVELS COMMERCIAL IN PODIUM + RESIDENTIAL TOWER

ID	Address	FSR	HOB	Site Area	Podium Footprint	Retail GFA (35%)	Comm. 2 levels GFA (80%)	Res. Footprint	Storeys	Res. GFA (75%)	Units (85sqm)	Total GFA	FSR	Height [(retai/commercial 12m) + (res storeys x 3.1m)]
A1	1-3 Oxford	4.5	48	990	strata	300								
C1	18-24 Oxford Street	4.5	48	1350	1180	413	1888	585	9	3949	46	6250	4.6	39.9
C2	26-28 Oxford Street	4.5	48	700	600	210	960	226	12	2034	24	3204	4.6	49.2
F	30-30E Rawson Street & part 9 Bridge Street	6	72	1370	1270	445	2032	355	20	5325	63	7802	5.7	74
I	41-47 Beecroft Road	6	72	1475	1409	493	2254	450	18	6075	71	8823	6.0	67.8
M	51 Rawson Street	4.5	48	2060	1980	693	3168	789	9	5326	63	9187	4.5	39.9
N	51A Rawson Street	4.5	48	7445		2083	6666	2220	15	24975	294	33724	4.5	2+ towers
Q	36-38 Victoria Street	4.5	48	4465	strata	0	0			0	0	0		
R	246-250 Carlingford Road	4.5	48	3010	3010	1054	4816	955	11	7879	93	13748	4.6	46.1
S	74-76 Rawson St	6	72	4141	strata	1061	2336							
T	53 -61 Rawson Street	4.5	48	9021	6021	2107	9634	2745	14	28823	339	40563	4.5	2+ towers
V	Lyon Site	6	72	6584	6123	3674	9797	1800	20	27000	318	40471	6.1	2 towers
	Total					12232	43551			111385	1310	163771		

SCENARIO 2- GROUND FLOOR RETAIL + 2 LEVELS COMMERCIAL IN PODIUM (not included in FSR) + RESIDENTIAL TOWER

ID	Address	FSR	HOB	Site Area	Podium Footprint	Retail GFA (35%)	Comm. 2 levels GFA (80%)	Res. Footprint	Res storeys if commercial levels are not included in FSR	Res. GFA (75%)	Units (85sqm)	GFA retail + res	FSR retail + res	Total GFA retail + res + comm	FSR retail + res + comm	Height [(retai/commercial 12m) + (res storeys x 3.1m)]	Extra res. storeys required
A1	1-3 Oxford	4.5	48	990	strata	300											
C1	18-24 Oxford Street	4.5	48	1350	1180	413	1888	585	13	5704	67	6117	4.5	8005	5.9	52.3	4
C2	26-28 Oxford Street	4.5	48	700	600	210	960	226	17	2882	34	3092	4.4	4052	5.8	64.7	5
F	50-50E Rawson Street & part 9 Bridge Street	6	72	1370	1270	445	2032	355	29	7721	91	8166	6.0	10198	7.4	101.9	9
I	41-47 Beecroft Road	6	72	1475	1409	493	2254	450	25	8438	99	8931	6.1	11185	7.6	89.5	7
M	51 Rawson Street	4.5	48	2060	1980	693	3168	789	15	8876	104	9569	4.6	12737	6.2	58.5	6
N	51A Rawson Street	4.5	48	7445		2083	6666	2220	19	31635	372	33718	4.5	40384	5.4	2+ towers	4
Q	36-38 Victoria Street	4.5	48	4465	strata	0	0			0	0	0					
R	246-250 Carlingford Road	4.5	48	3010	3010	1054	4816	955	18	12893	152	13946	4.6	18762	6.2	67.8	7
S	74-76 Rawson St	6	72	4141	strata	1061	2336										
T	53 -61 Rawson Street	4.5	48	9021	6021	2107	9634	2745	19	39116	460	41224	4.6	50857	5.6	2+ towers	5
V	Lyon Site	6	72	6584	6123	3674	9797	1800	27	36450	429	40124	6.1	49921	7.6	2 towers	7
	Total					12232	43551			153714	1808			206100			

ALL SCENARIOS EXISTING RETAIL/COMMERCIAL/RESIDENTIAL IN TOWN CENTRE (APPROVED DAs OR DAs UNDER ASSESSMENT)

Site No.	Site	FSR	HOB	Site Area		Proposed /actual retail	Proposed/actual comm	Res. Footprint	Storeys	Res. GFA (75%)	Units (85sqm)	Total GFA	FSR	Height
33	35 Oxford Street	4.5	72			115	0			4259	**54**		**4.5:1**	
35	18-28 Cambridge	4.5	72			1154	0			36259	**501**			
40	30-42 Oxford Street	4.5	48			625	0			22640	**254**			
42	12-22 Langston Place	6	72			1681	0			41394	**464**			
44	24-36 Langston Place	6	72			256	559			7645	**101**			
46	37-41 Oxford Street *	4.5	72			150	1133			21000	**257**			
50	48-54 Beecroft Road & 52-54 Rawson Street **	6	72	2062		1033	0		21	11334	**130**	**12367**	**6:01**	
59	16-18 Cambridge Street	4.5	72	1971		396.93	823.71		22	6,091.00	**84**	**7311.51**	**3.8:1**	**73.83**
60	29-33 Oxford Street & 6-14 Cambridge Street Catholic Church Site					200	0		29	14620	**172**			
	Total					**5611**	**2515.71**				**2017**			

Appendix C

EMME2 and Dynameq network outputs

Dynameq – network characteristics
AM

In Dynameq we need integers to represent vehicles

Mathematics
Imagine 10 trips going to 19 zones: each cell would contain 10/19 = 0.526 trips
If we applied normal rounding – each number in the cell would be rounded up to an integer: 1
In this case each cell would have a "1" and the total for this row = 19 * 1 = 19 (we started with 10 trips)

Mathematically – "before" and "after" totals must be the same
Instead we use "bucket rounding" – so that the total = 10, but some cells have "0" and others have a "1"

Issues of bucket rounding process
Since we do this for 15 minute slices – numbers are multiplied by 4:

- the smallest number in the "hour" matrix is "0" followed by "4"

(The ABS uses something similar and the smallest is "0" and then a "3")

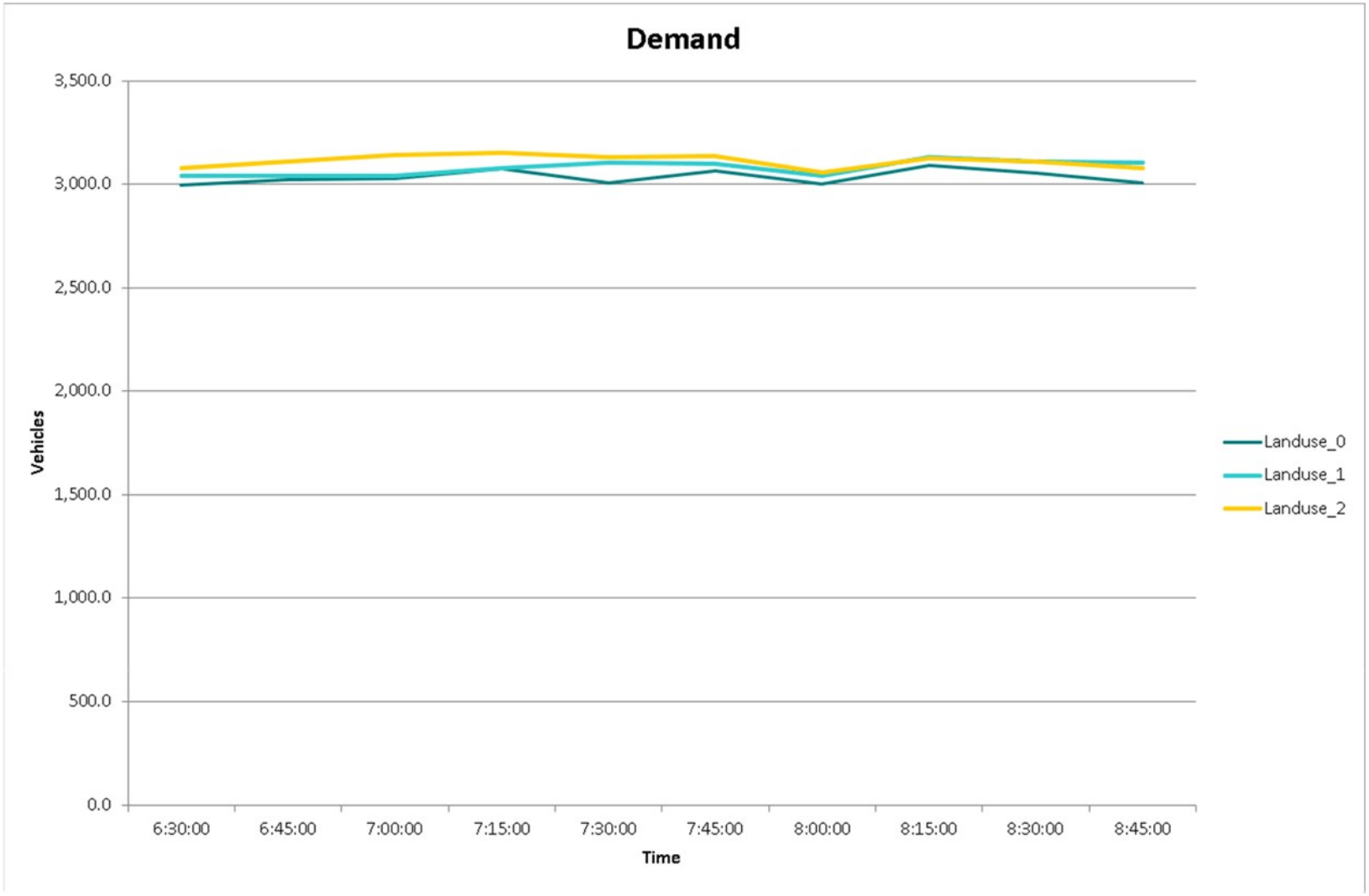
In this study the future travel demand is split into equal 15 minute slices

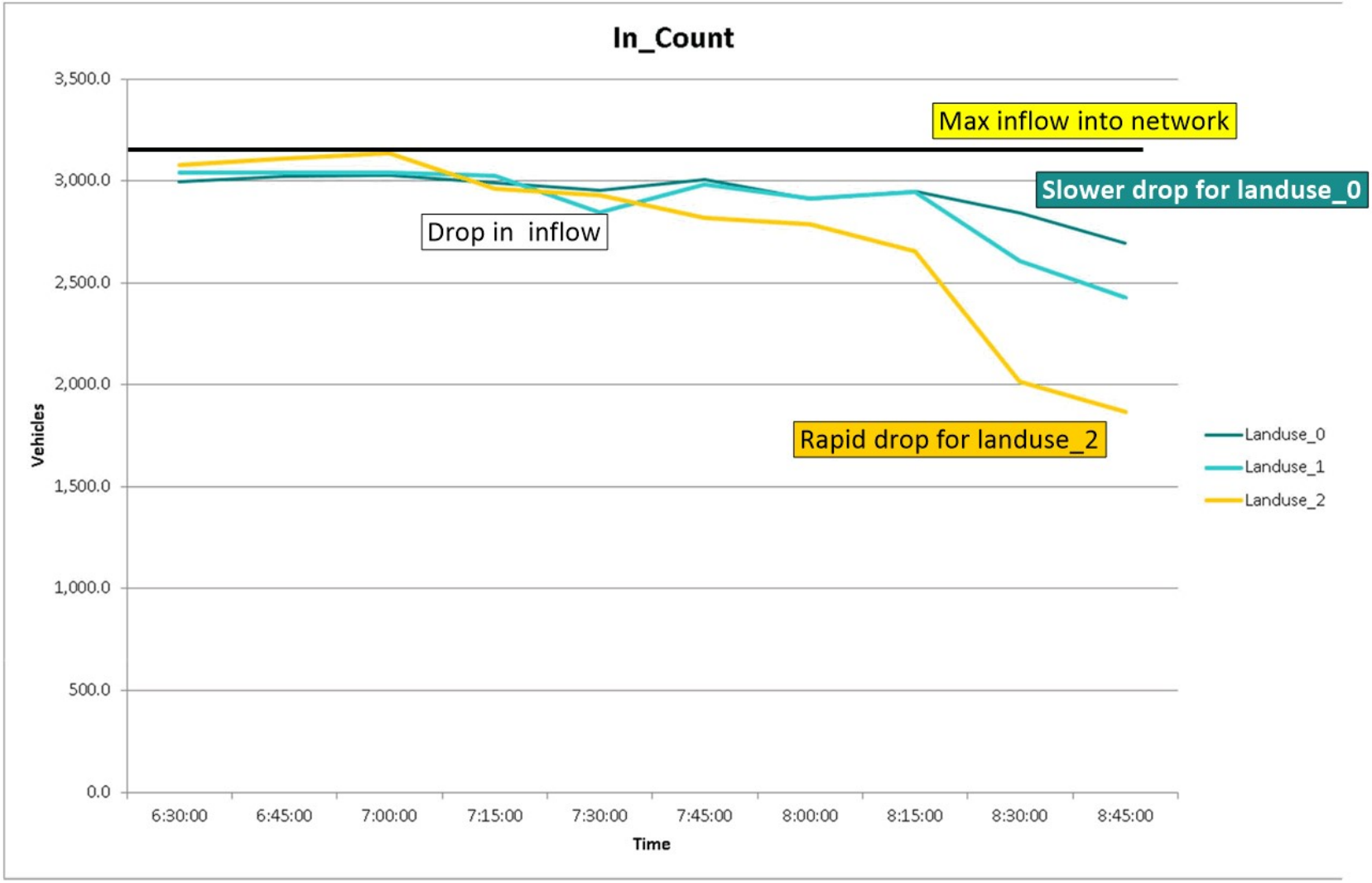
- the totals are "hourly flows"
- should be uniform for the hour

The "wobbling" in the Demand plot is the result of the background manipulations – nothing too serious!

The tiny kink at 08:00:00 is like to come from the random number generator

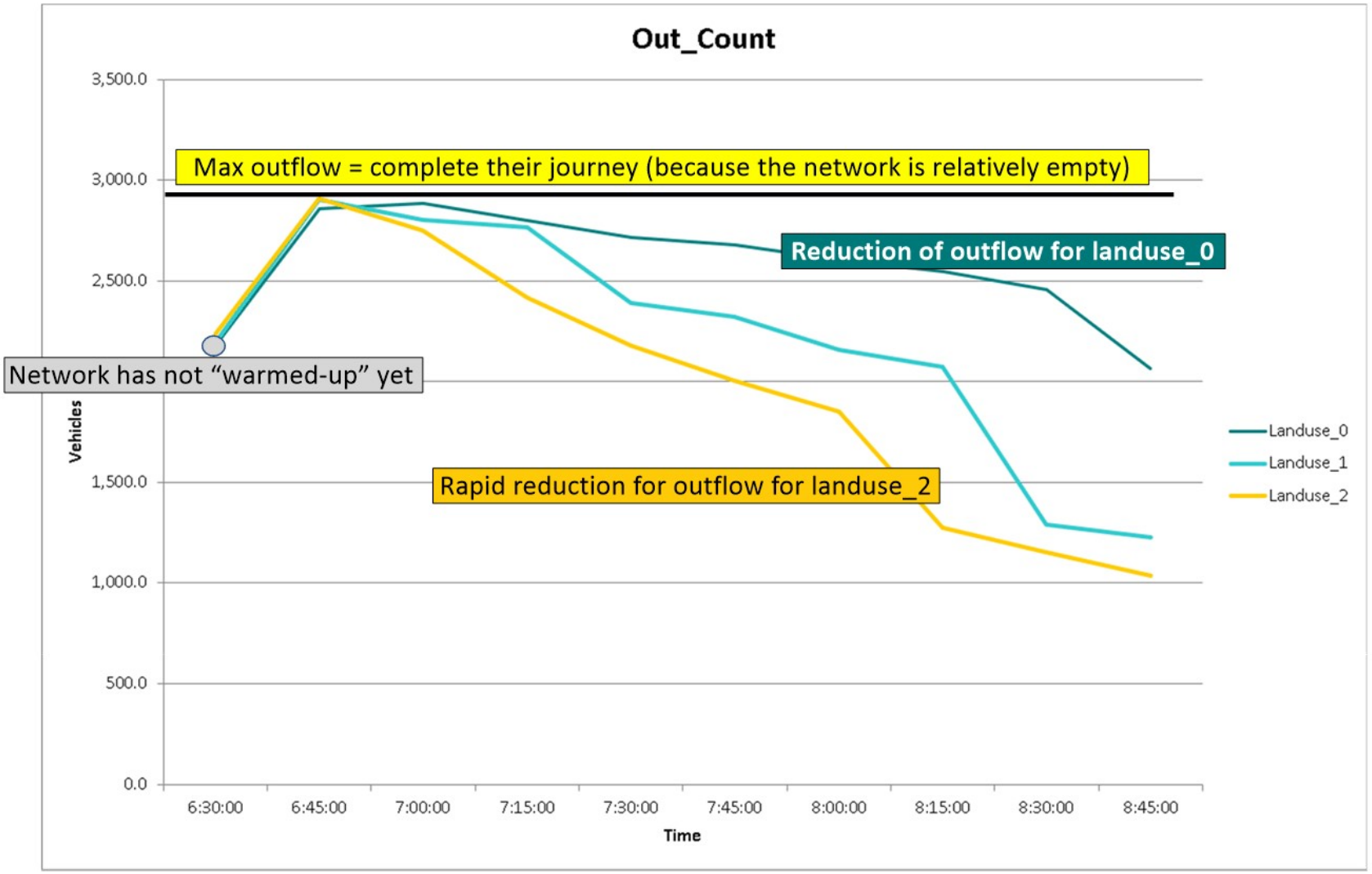
- The random number is used to generate the actual number of vehicles from the chosen probability function

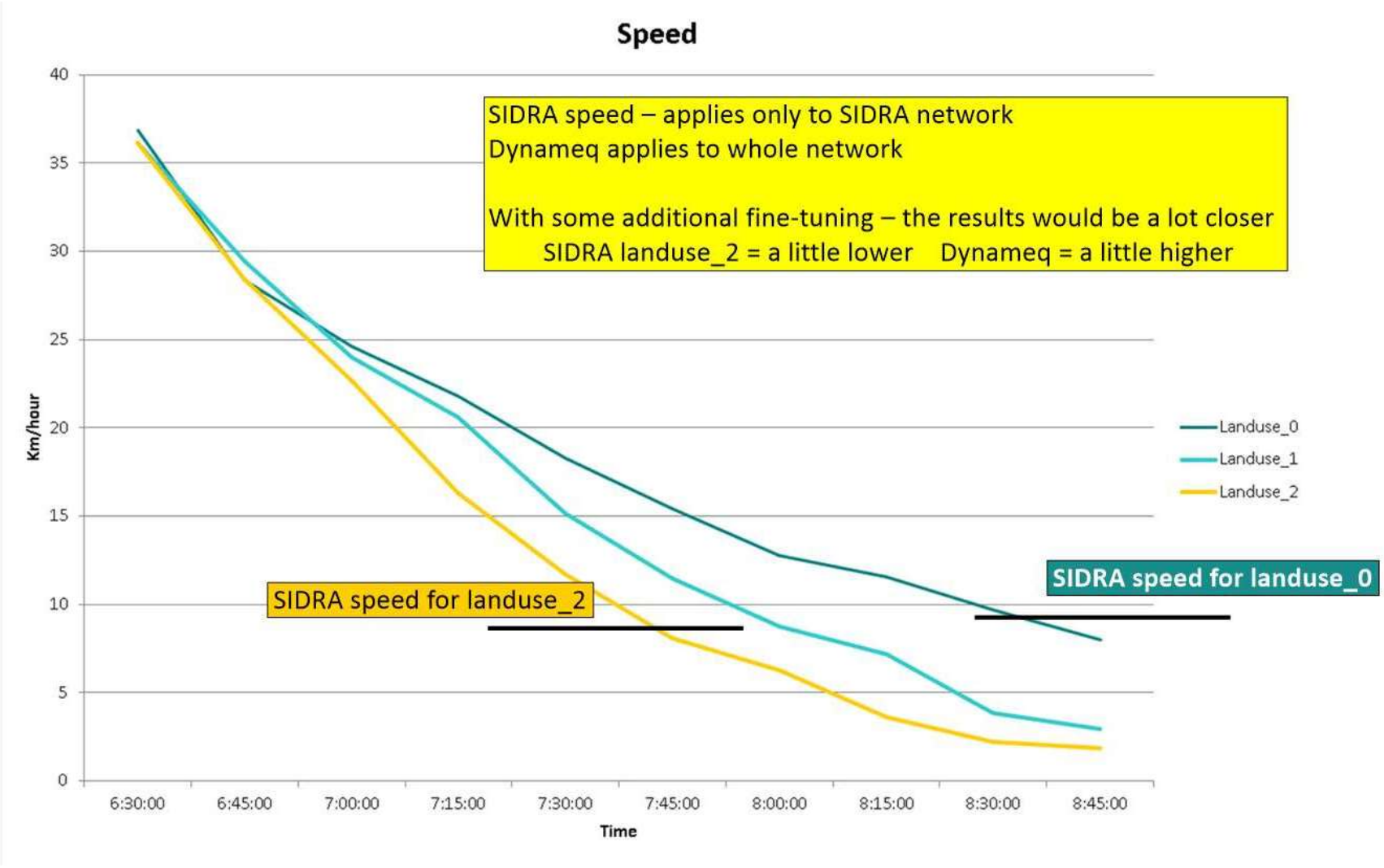

Demand
3,500.0
3,000.0
2,500.0
2,000.0
1,500.0
1,000.0
500.0
0.0
Vehicles
6:30:00
6:45:00
7:00:00
7:15:00
7:30:00
7:45:00
8:00:00
8:15:00
8:30:00
8:45:00
Time
Landuse_0
Landuse_1
Landuse_2


In_Count
3,500.0
3,000.0
2,500.0
2,000.0
1,500.0
1,000.0
500.0
0.0
Vehicles
6:30:00
6:45:00
7:00:00
7:15:00
7:30:00
7:45:00
8:00:00
8:15:00
8:30:00
8:45:00
Time
Max inflow into network
Slower drop for landuse_0
Drop in inflow
Rapid drop for landuse_2
Landuse_0
Landuse_1
Landuse_2

Most of those who start “early” in the first time-slice are able to complete their journey
Those who start “late” in the first time-slice would not reach their end point – they are still travelling
In the next time-slice, the inflow (=same are previous inflow in this case) and outflow are a more valid

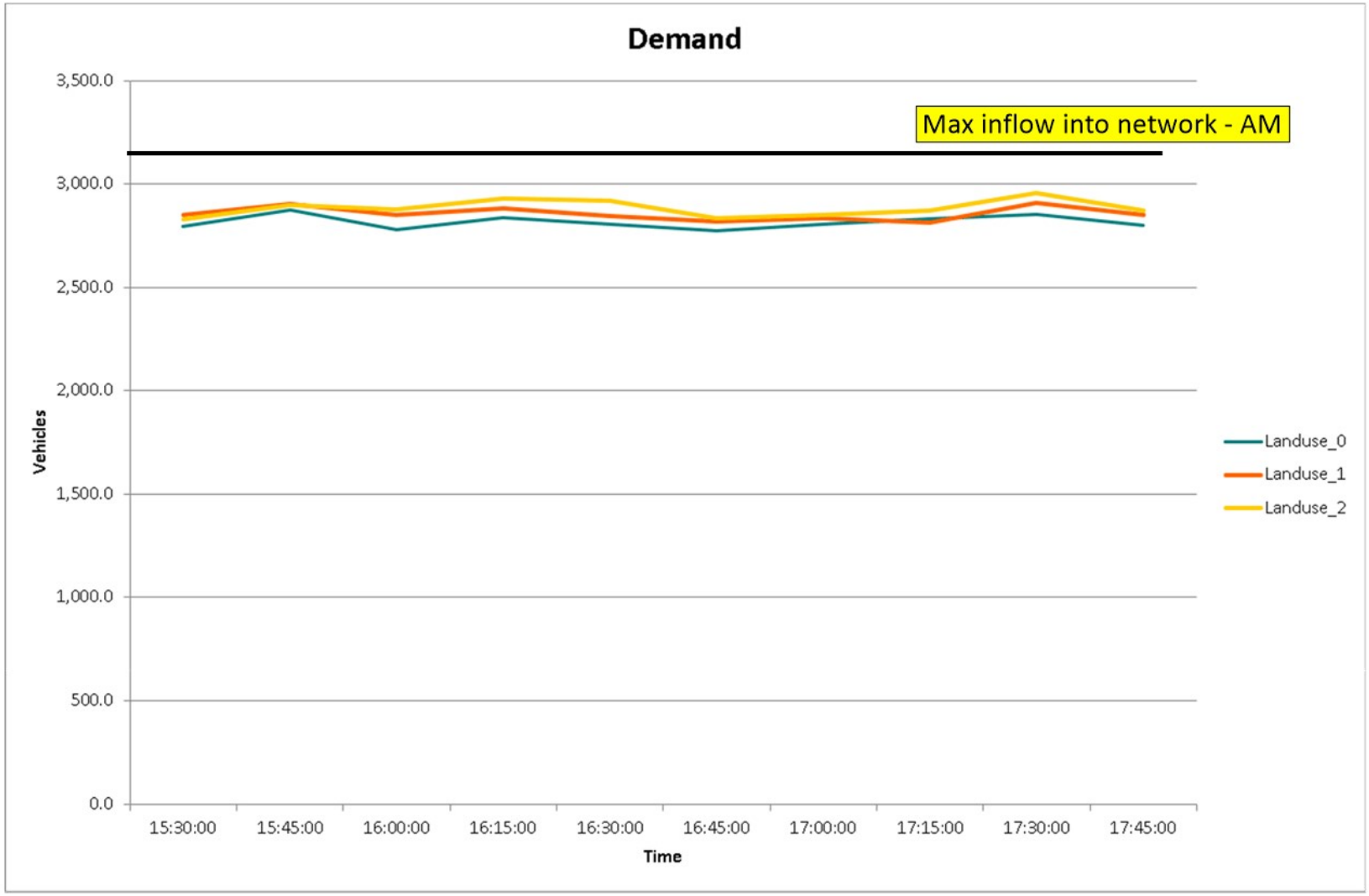
Modellers normally do not show the first point as it only causes confusion
They diplomatically refer to this as point as the “warm-up” period (a science in its own right)

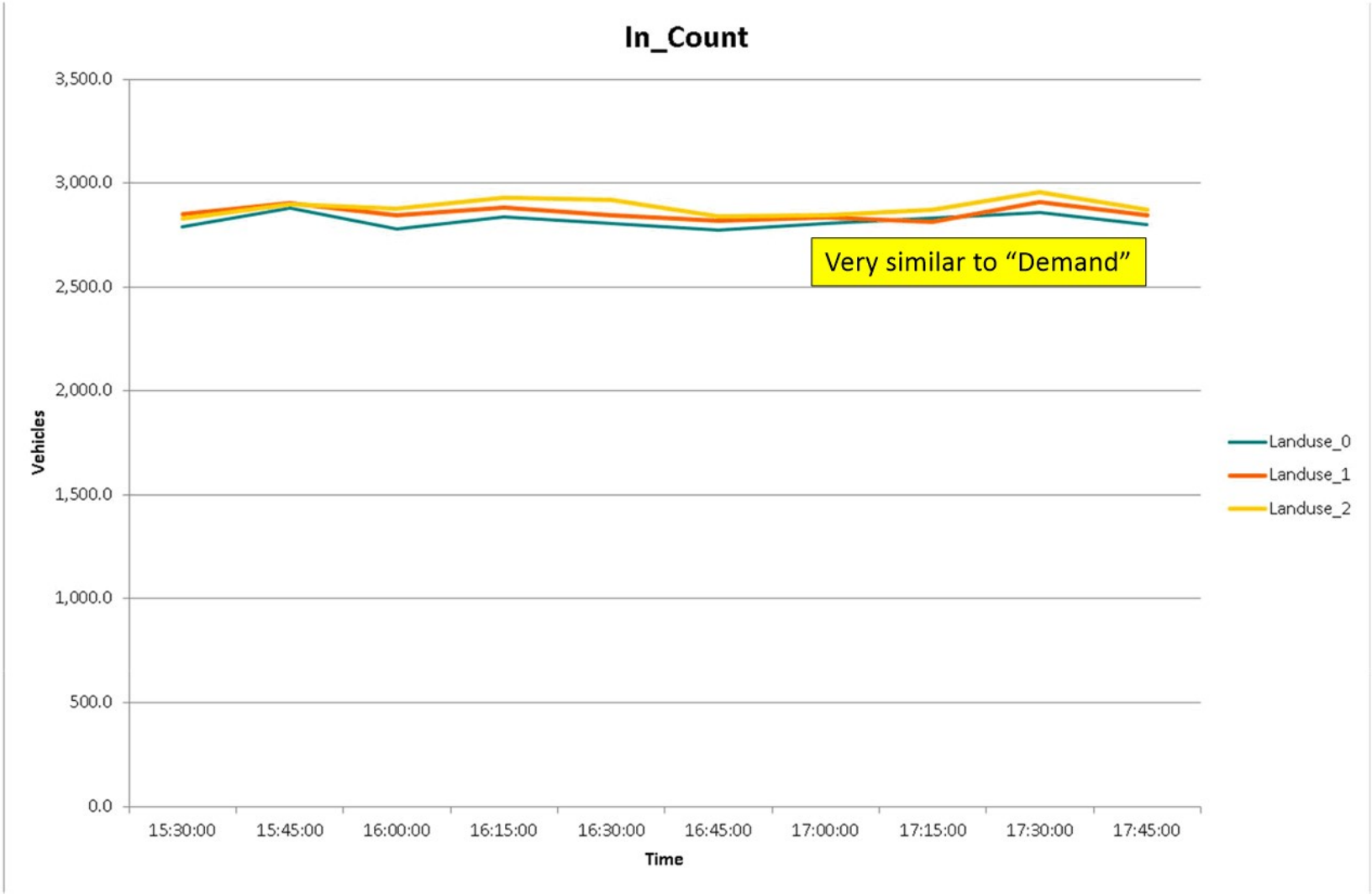

Out_Count
3,500.0
3,000.0
2,500.0
1,500.0
1,000.0
500.0
0.0
Vehicles
Max outflow = complete their journey (because the network is relatively empty)
Reduction of outflow for landuse_0
Network has not "warmed-up" yet
Rapid reduction for outflow for landuse_2
Landuse_0
Landuse_1
Landuse_2
6:30:00
6:45:00
7:00:00
7:15:00
7:30:00
7:45:00
8:00:00
8:15:00
8:30:00
8:45:00
Time


Speed
SIDRA speed – applies only to SIDRA network
Dynameq applies to whole network
With some additional fine-tuning – the results would be a lot closer
SIDRA landuse_2 = a little lower Dynameq = a little higher
SIDRA speed for landuse_2
SIDRA speed for landuse_0
Km/hour
Time
Landuse_0
Landuse_1
Landuse_2
40
35
30
25
20
15
10
5
0
6:30:00
6:45:00
7:00:00
7:15:00
7:30:00
7:45:00
8:00:00
8:15:00
8:30:00
8:45:00

The network needs a couple more days for this fine-tuning
This allows the speeds and “suppressed traffic” to be a lot closer

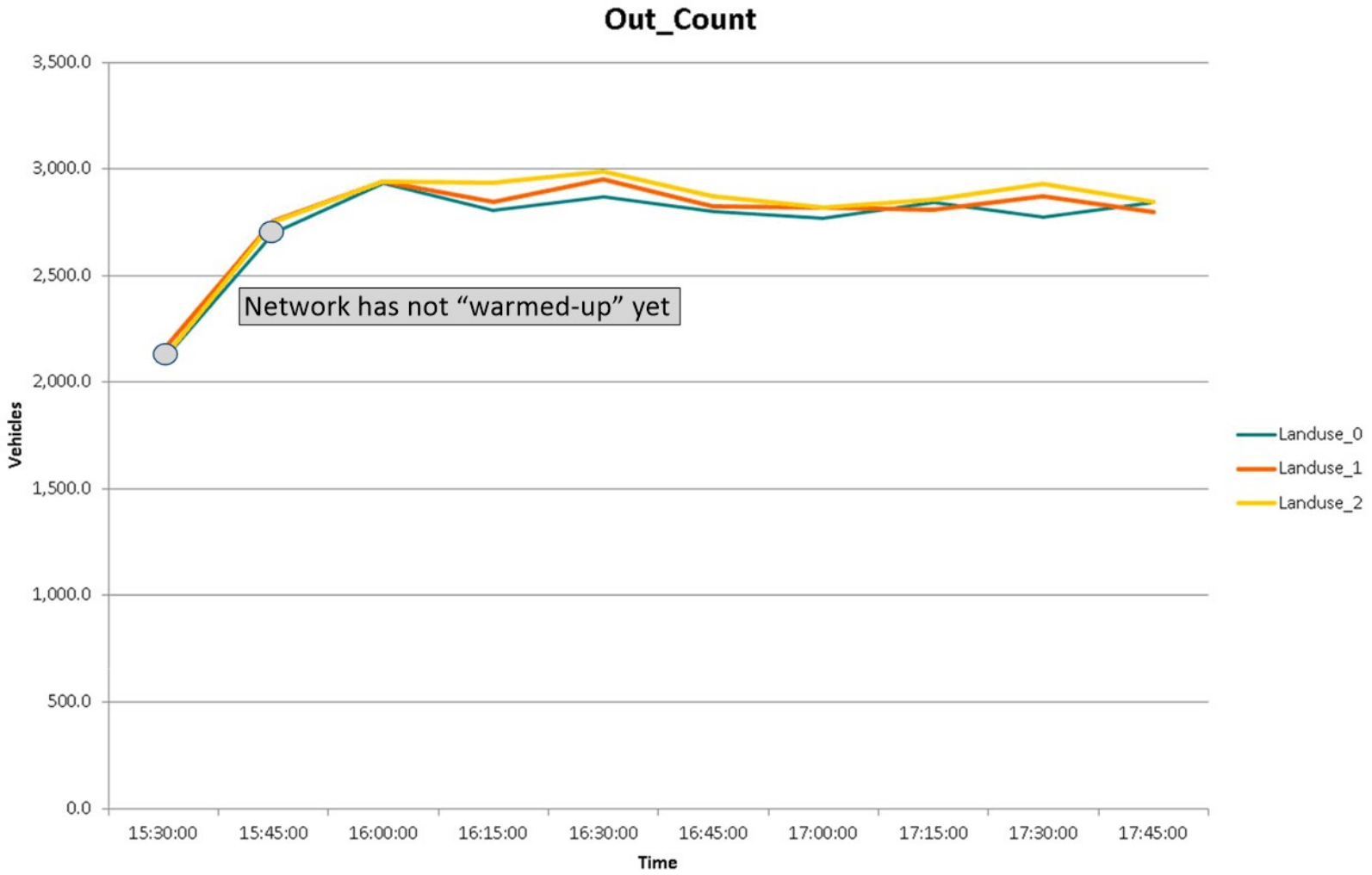
Dynameq – network characteristics
PM

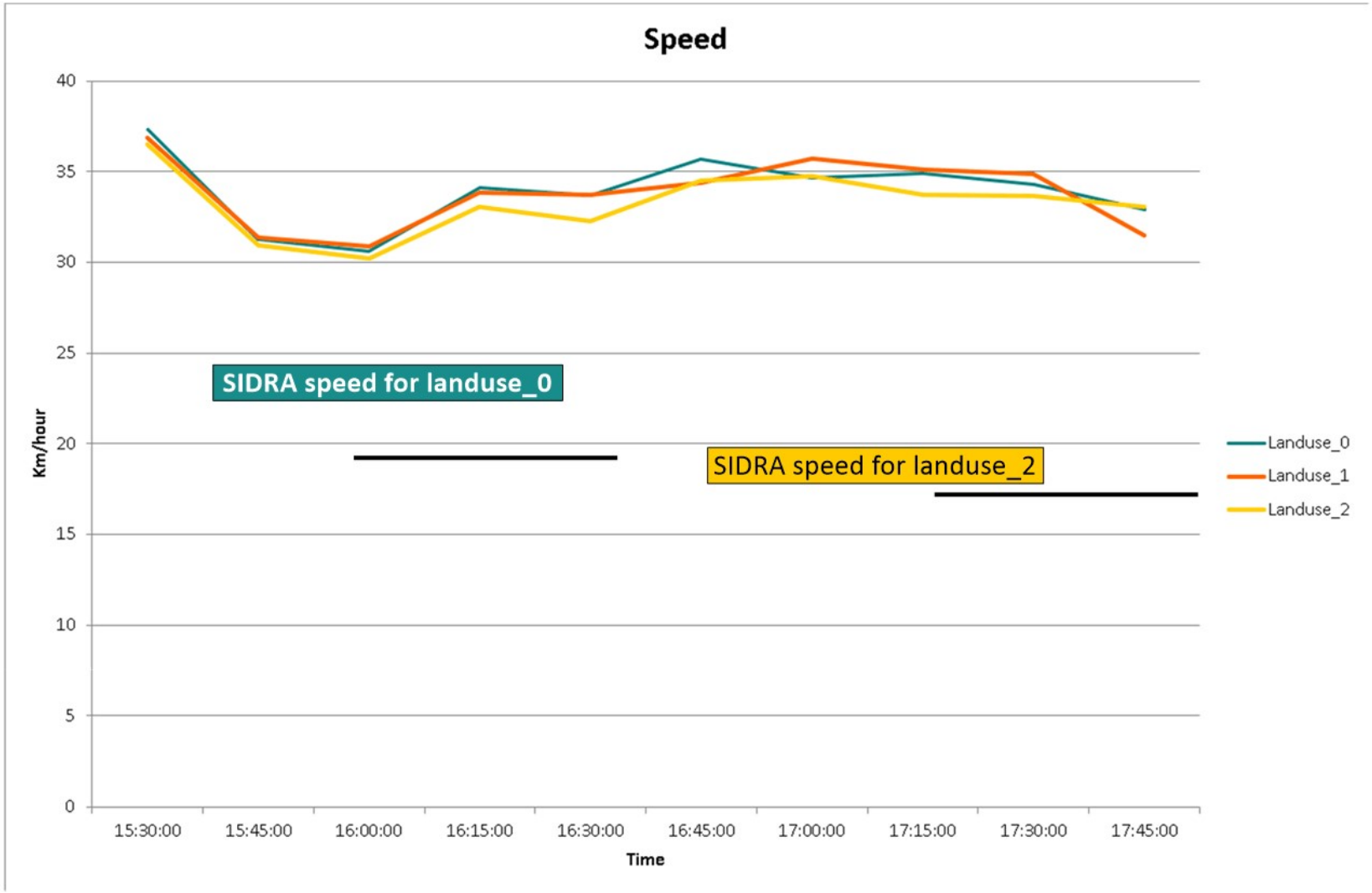

Demand
Max inflow into network - AM
3,500.0
3,000.0
2,500.0
2,000.0
1,500.0
1,000.0
500.0
0.0
Vehicles
15:30:00
15:45:00
16:00:00
16:15:00
16:30:00
16:45:00
17:00:00
17:15:00
17:30:00
17:45:00
Time
Landuse_0
Landuse_1
Landuse_2


In_Count
3,500.0
3,000.0
2,500.0
2,000.0
1,500.0
1,000.0
500.0
0.0
Vehicles
15:30:00
15:45:00
16:00:00
16:15:00
16:30:00
16:45:00
17:00:00
17:15:00
17:30:00
17:45:00
Time
Very similar to "Demand"
Landuse_0
Landuse_1
Landuse_2

When a network is relatively free-flowing – we can observe the impact of impact loading
The first couple of data points shows the "warm-up period
The next couple of points shows the bounce up and then it is "normal"

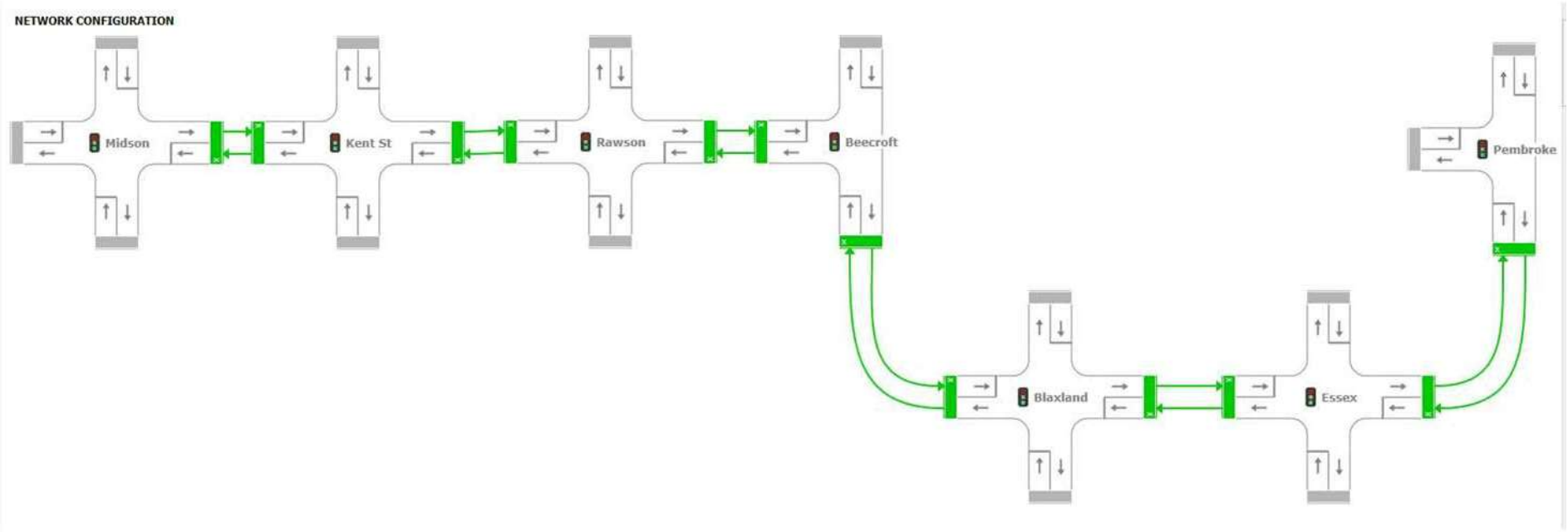
I am not sure why the SIDRA results show such low speeds with a relatively "low" demand
This requires more work on my part


Out_Count
3,500.0
3,000.0
2,500.0
2,000.0
1,500.0
1,000.0
500.0
0.0
Vehicles
Network has not “warmed-up” yet
15:30:00
15:45:00
16:00:00
16:15:00
16:30:00
16:45:00
17:00:00
17:15:00
17:30:00
17:45:00
Time
Landuse_0
Landuse_1
Landuse_2


Speed
40
35
30
25
20
15
10
5
0
Km/hour
SIDRA speed for landuse_0
SIDRA speed for landuse_2
15:30:00
15:45:00
16:00:00
16:15:00
16:30:00
16:45:00
17:00:00
17:15:00
17:30:00
17:45:00
Time
Landuse_0
Landuse_1
Landuse_2

Appendix D

SIDRA network model outputs


NETWORK CONFIGURATION
Midson
Kent St
Rawson
Beecroft
Pembroke
Blaxland
Essex

Summary of overall network performance and SIDRA Intersection Delays (AM Peak Hour)

Intersection	Vehicle Performance	AM Peak hour 2026 Baseline Landuse_0	AM Peak hour 2026 Option Landuse_1	AM Peak hour 2026 Option Landuse_2
Overall Network Performance	LOS and Travel Speed (km/hr)	F 9.4 km/hr	F 9.3 km/hr	F 8.8 km/hr
Carlingford Road and Midson Road	Vehicle Demand Suppressed Traffic D-SAT AV-Delay (secs) LOS	2,968 81 1.335 379.8 F	3,034 101 1.229 262.9 F	3,045 103 1.232 266.4 F
Carlingford Road and Kent Street	Vehicle Demand Suppressed Traffic D-SAT AV-Delay (secs) LOS	2,837 421 0.802 18.2 B	2,888 374 0.858 20.9 B	2,905 381 0.859 20.5 B
Carlingford Road Ray Road and Rawson Street	Vehicle Demand Suppressed Traffic D-SAT AV-Delay (secs) LOS	3,386 387 4.802 706.6 F	3,478 355 5.392 765.9 F	3,526 358 5.647 840.8 F
Carlingford Road and Beecroft Road	Vehicle Demand Suppressed Traffic D-SAT AV-Delay (secs) LOS	4,671 552 1.294 92.1 F	4,698 500 1.383 109.9 F	4,721 531 1.387 109.5 F
Epping Road Blaxland Road and Langston Place	Vehicle Demand Suppressed Traffic D-SAT AV-Delay (secs) LOS	4,770 534 1.103 38.6 C	4,816 489 1.186 45.8 D	4,840 520 1.193 50.5 D
Epping Road and Essex Street	Vehicle Demand Suppressed Traffic D-SAT AV-Delay (secs) LOS	3,720 314 1.127 91.3 F	3,747 275 1.144 109.0 F	3,763 295 1.147 111.0 F
Epping Road and Pembroke Street	Vehicle Demand Suppressed Traffic D-SAT AV-Delay (secs) LOS LOS	2,953 293 0.879 13.9 A	2,963 269 0.916 16.7 B	2,971 287 0.916 16.7 B
Hourly Volume of Suppressed Traffic (Blocked at Upstream Intersections)				
Change in Level of Service Compared to the Base Case				

Summary of overall network performance and SIDRA Intersection Delays (PM Peak Hour)

Intersection	Network Performance	PM Peak hour 2026 Baseline Landuse_0	PM Peak hour 2026 Option Landuse_1	PM Peak hour 2026 Option Landuse_2
Overall Network Performance	LOS and Travel Speed (km/hr)	D 19.3 km/hr	E 17.8 km/hr	E 17.4 km/hr
Carlingford Road and Midson Road	Vehicle Demand Suppressed Traffic D-SAT AV-Delay (secs) LOS	2,778 144 0.849 35.1 C	2,796 154 0.859 35.2 C	2,802 158 0.859 35.2 C
Carlingford Road and Kent Street	Vehicle Demand Suppressed Traffic D-SAT AV-Delay (secs) LOS	2,477 68 0.608 20.1 B	2,503 179 0.607 19.8 B	2,515 210 0.597 18.8 B
Carlingford Road Ray Road and Rawson Street	Vehicle Demand Suppressed Traffic D-SAT AV-Delay (secs) LOS	2,815 189 0.901 25.0 B	2,883 204 0.868 26.3 B	2,910 209 0.876 27.1 B
Carlingford Road and Beecroft Road	Vehicle Demand Suppressed Traffic D-SAT AV-Delay (secs) LOS	4,065 0 2.344 241.6 F	4,094 0 2.567 278.6 F	4,103 0 2.635 291.1 F
Epping Road Blaxland Road and Langston Place	Vehicle Demand Suppressed Traffic D-SAT AV-Delay (secs) LOS	4,294 0 1.132 43.3 D	4,325 0 1.264 54.0 D	4,342 0 1.270 54.7 D
Epping Road and Essex Street	Vehicle Demand Suppressed Traffic D-SAT AV-Delay (secs) LOS	3,266 0 0.931 36.2 C	3,289 0 0.908 36.1 C	3,298 0 0.885 35.4 C
Epping Road and Pembroke Street	Vehicle Demand Suppressed Traffic D-SAT AV-Delay (secs) LOS LOS	2,302 0 0.907 13.0 A	2,307 0 0.907 12.8 A	2,310 0 0.907 12.9 A
Hourly Volume of Suppressed Traffic (Blocked at Upstream Intersections)				
Change in Level of Service Compared to the Base Case				

AM SIDRA yellow numbers for Suppressed Traffic at Intersections

= Calculated Total Length of all Intersection Traffic Queues

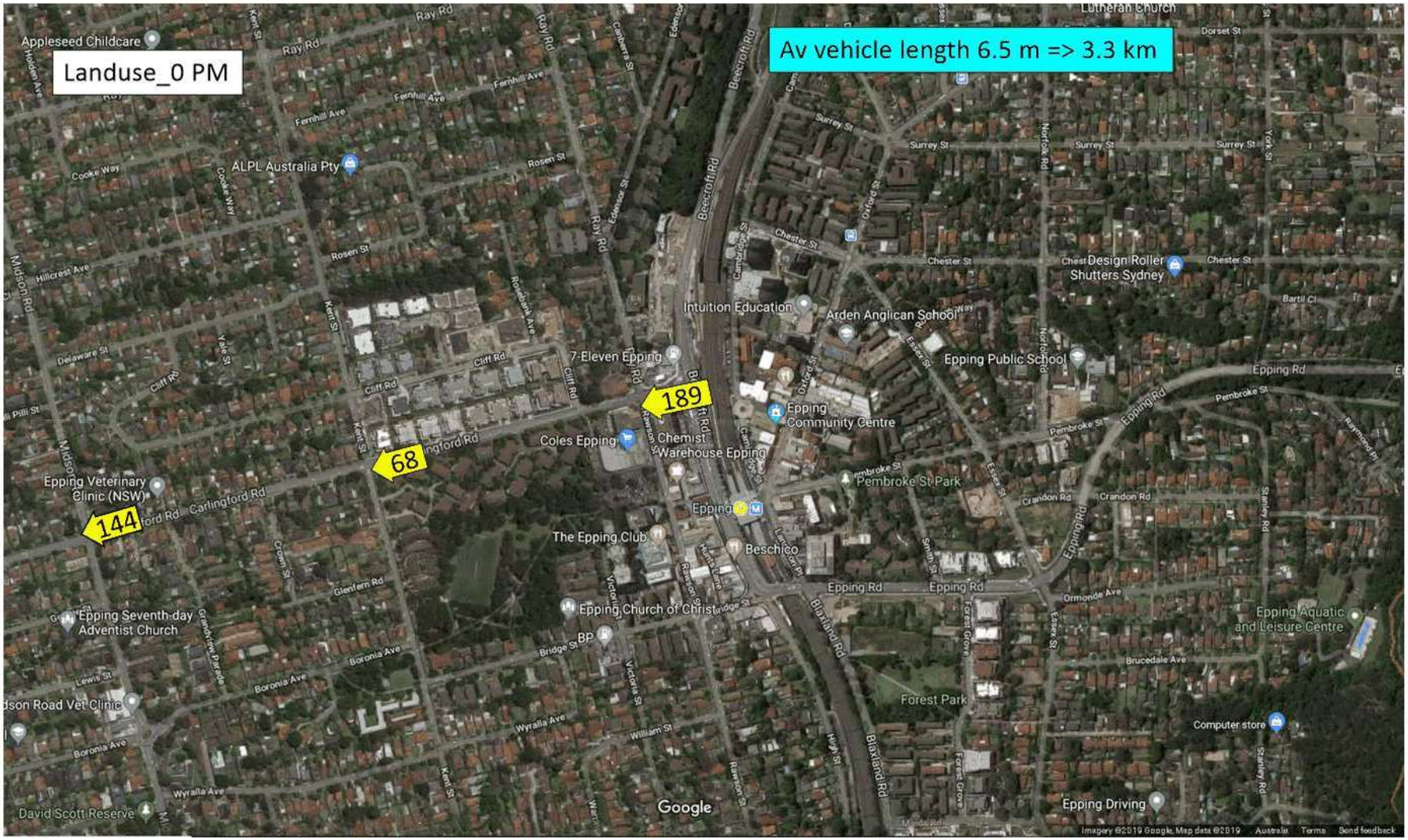

Landuse_0 AM
Av vehicle length 6.5 m => 16.8 km
271
489
116
93
372
98
81
460
74
314
293
Appleseed Childcare
ALPL Australia Pty
Intuition Education
Arden Anglican School
Epping Public School
Design Roller Shutters Sydney
Epping Community Centre
Coles Epping
Chemist Warehouse Epping
Pembroke St Park
Epping Veterinary Clinic (NSW)
The Epping Club
Beschico
Epping Church of Christ
Epping Seventh-day Adventist Church
BP
Epping Aquatic and Leisure Centre
Forest Park
Computer store
Epping Driving
David Scott Reserve
Google

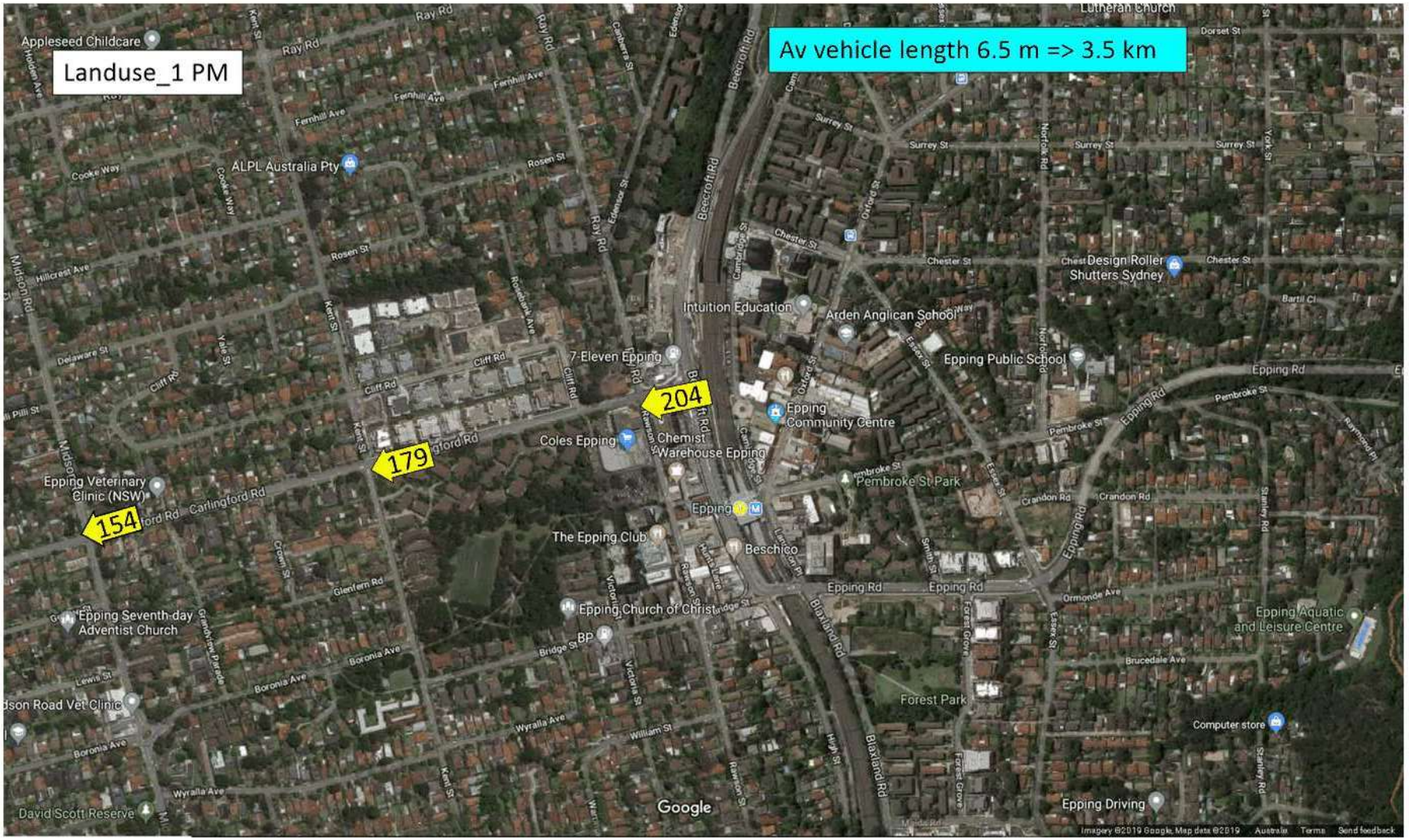

Landuse_1 AM
Av vehicle length 6.5 m => 15.4 km
211
427
114
73
256
118
101
269
402
87
275
Appleseed Childcare
ALPL Australia Pty
Intuition Education
Arden Anglican School
Epping Public School
Design Roller Shutters Sydney
7-Eleven Epping
Epping Community Centre
Coles Epping
Chemist Warehouse Epping
Epping Veterinary Clinic (NSW)
Pembroke St Park
The Epping Club
Beschico
Epping Church of Christ
Epping Seventh-day Adventist Church
BP
Epping Aquatic and Leisure Centre
Forest Park
Computer store
Epping Driving
David Scott Reserve
Google

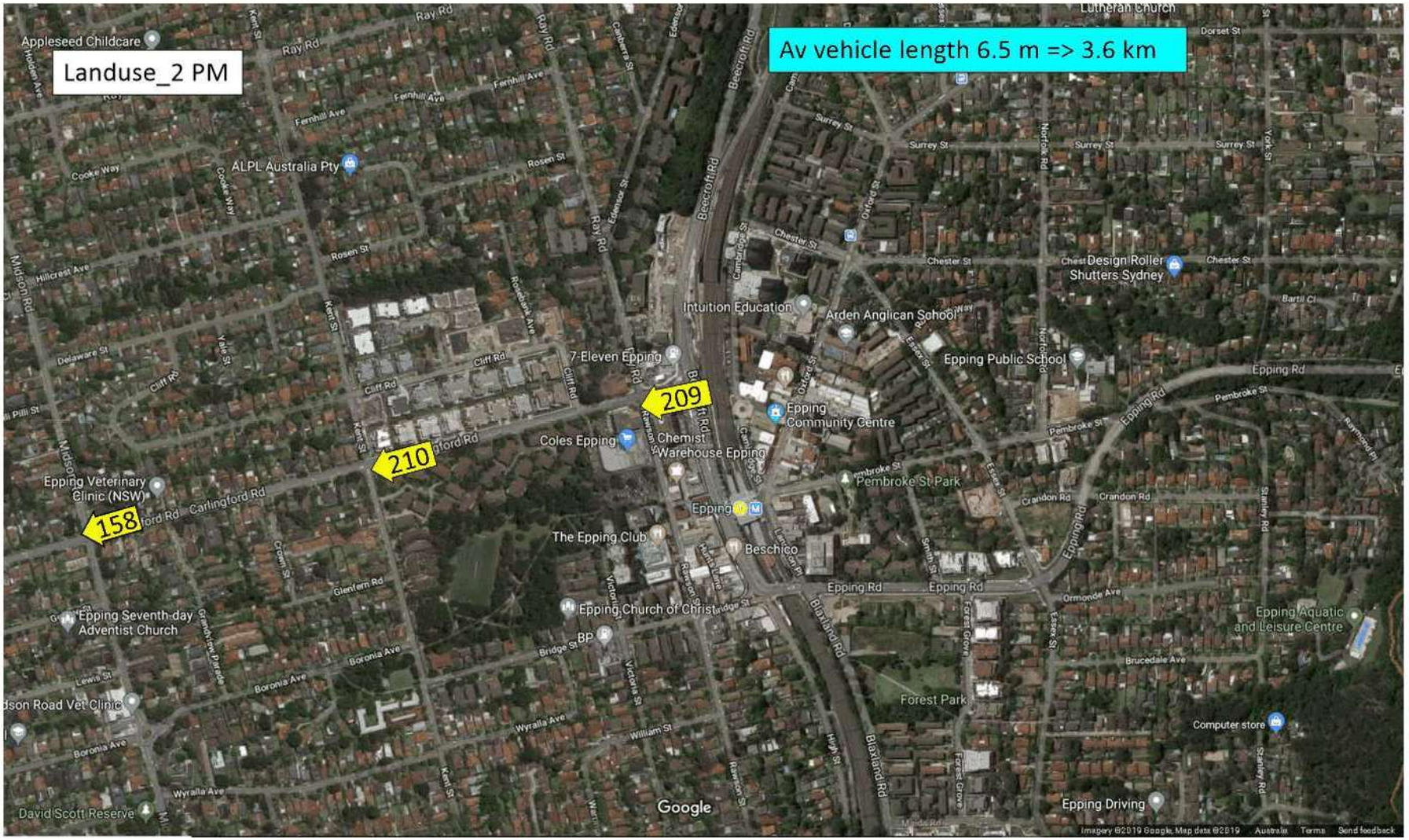

Landuse_2 AM
Av vehicle length 6.5 m => 16.1 km
214
457
144
74
260
171
103
430
90
295
287
Appleseed Childcare
ALPL Australia Pty
Intuition Education
Arden Anglican School
Epping Public School
Design Roller Shutters Sydney
Epping Community Centre
Coles Epping
Chemist Warehouse Epping
Pembroke St Park
Epping Veterinary Clinic (NSW)
The Epping Club
Beschico
Epping Church of Christ
Epping Seventh-day Adventist Church
BP
Epping Aquatic and Leisure Centre
Forest Park
Computer store
Epping Driving
David Scott Reserve
Google

PM SIDRA yellow numbers for Suppressed Traffic at Intersections

= Calculated Total Length of all Intersection Traffic Queues


Landuse_0 PM
Av vehicle length 6.5 m => 3.3 km
189
68
144
Appleseed Childcare
ALPL Australia Pty
Intuition Education
Arden Anglican School
Epping Public School
Design Roller Shutters Sydney
7-Eleven Epping
Epping Community Centre
Coles Epping
Chemist Warehouse Epping
Pembroke St Park
Epping Veterinary Clinic (NSW)
The Epping Club
Beschico
Epping Church of Christ
Epping Seventh-day Adventist Church
BP
Epping Aquatic and Leisure Centre
Forest Park
Computer store
Epping Driving
David Scott Reserve
Google


Landuse_1 PM
Av vehicle length 6.5 m => 3.5 km
204
179
154
Appleseed Childcare
ALPL Australia Pty
Intuition Education
Arden Anglican School
Epping Public School
Design Roller Shutters Sydney
7-Eleven Epping
Epping Community Centre
Coles Epping
Chemist Warehouse Epping
Epping Veterinary Clinic (NSW)
Pembroke St Park
The Epping Club
Beschico
Epping Church of Christ
Epping Seventh-day Adventist Church
BP
Epping Aquatic and Leisure Centre
Forest Park
Computer store
Epping Driving
David Scott Reserve
Google


Landuse_2 PM
Av vehicle length 6.5 m => 3.6 km
209
210
158
Appleseed Childcare
ALPL Australia Pty
Intuition Education
Arden Anglican School
Epping Public School
Design Roller Shutters Sydney
7-Eleven Epping
Epping Community Centre
Coles Epping
Chemist Warehouse Epping
Epping Veterinary Clinic (NSW)
Pembroke St Park
The Epping Club
Beschico
Epping Church of Christ
Epping Seventh-day Adventist Church
BP
Epping Aquatic and Leisure Centre
Forest Park
Computer store
Epping Driving
David Scott Reserve
Google

NETWORK SUMMARY

Network: N101 [2026_am_landuse_0_AM_signals_only]

2026_am_landuse_0_AM_signals_only
Network Category: (None)
Network Cycle Time = 72 seconds (Network Optimum Cycle Time - Minimum Delay)

Network Performance - Hourly Values

Performance Measure	Vehicles	Per Unit Distance	Pedestrians	Persons
Network Level of Service (LOS)	LOS F			
Travel Time Index	1.50			
Speed Efficiency	0.24			
Congestion Coefficient	4.25			
Travel Speed (Average)	9.4 km/h		2.7 km/h	9.4 km/h
Travel Distance (Total)	13085.8 veh-km/h		10.3 ped-km/h	15713.2 pers-kn
Travel Time (Total)	1390.2 veh-h/h		3.8 ped-h/h	1672.1 pers-h/l
Desired Speed	40.0 km/h			
Demand Flows (Total for all Sites)	25305 veh/h		342 ped/h	30708 pers/h
Arrival Flows (Total for all Sites)	22722 veh/h		342 ped/h	27608 pers/h
Demand Flows (Entry Total)	8259 veh/h			
Midblock Inflows (Total)	81 veh/h			
Midblock Outflows (Total)	-302 veh/h			
Percent Heavy Vehicles (Demand)	0.0 %			
Percent Heavy Vehicles (Arrival)	0.0 %			
Degree of Saturation	4.802			
Control Delay (Total)	1152.85 veh-h/h		1.62 ped-h/h	1385.04 pers-h/l
Control Delay (Average)	182.7 sec		17.1 sec	180.6 sec
Control Delay (Worst Lane)	6872.8 sec			
Control Delay (Worst Movement)	6872.8 sec		30.3 sec	6872.8 sec
Geometric Delay (Average)	0.7 sec			
Stop-Line Delay (Average)	182.0 sec			
Queue Storage Ratio (Worst Lane)	1.77			
Total Effective Stops	26783 veh/h		217 ped/h	32357 pers/h
Effective Stop Rate	1.18	2.05 per km	0.63	1.17
Proportion Queued	0.74		0.63	0.82
Performance Index	2359.7		5.0	2364.7
Cost (Total)	46996.61 $/h	3.59 $/km	96.52 $/h	47093.13 $/h
Fuel Consumption (Total)	2660.8 L/h	203.3 mL/km		
Fuel Economy	20.3 L/100km			
Carbon Dioxide (Total)	6252.9 kg/h	477.8 g/km		
Hydrocarbons (Total)	0.666 kg/h	0.051 g/km		
Carbon Monoxide (Total)	5.259 kg/h	0.402 g/km		
NOx (Total)	1.459 kg/h	0.111 g/km		

Network Model Variability Index (Iterations 3 to N): 16.8 %
Number of Iterations: 20 (Maximum: 50)
Largest change in Lane Degrees of Saturation or Queue Storage Ratios for the last three Network Iterations: 0.8% 0.7% 0.6%
Network Level of Service (LOS) Method: SIDRA Speed Efficiency.
Software Setup used: New South Wales.

Network Performance - Annual Values

Performance Measure	Vehicles	Pedestrians	Persons
Demand Flows (Total for all Sites)	12,146,490 veh/y	164,004 ped/y	14,739,800 pers/y
Delay	553,368 veh-h/y	777 ped-h/y	664,819 pers-h/y
Effective Stops	12,855,960 veh/y	104,087 ped/y	15,531,240 pers/y
Travel Distance	6,281,161 veh-km/y	4,935 ped-km/y	7,542,327 pers-km/y
Travel Time	667,310 veh-h/y	1,832 ped-h/y	802,604 pers-h/y
Cost	22,558,370 $/y	46,330 $/y	22,604,700 $/y
Fuel Consumption	1,277,189 L/y		
Carbon Dioxide	3,001,394 kg/y		
Hydrocarbons	319 kg/y		
Carbon Monoxide	2,524 kg/y		
NOx	700 kg/y		

NETWORK SUMMARY

Network: N101 [2026_am_landuse_0_PM_signals_only]

2026_am_landuse_0_PM_signals_only
Network Category: (None)
Network Cycle Time = 110 seconds (Network Optimum Cycle Time - Minimum Delay)

Network Performance - Hourly Values

Performance Measure	Vehicles	Per Unit Distance	Pedestrians	Persons
Network Level of Service (LOS)	LOS E			
Travel Time Index	4.26			
Speed Efficiency	0.48			
Congestion Coefficient	2.07			
Travel Speed (Average)	19.3 km/h		2.3 km/h	19.2 km/h
Travel Distance (Total)	12313.2 veh-km/h		10.3 ped-km/h	14786.2 pers-kn
Travel Time (Total)	637.4 veh-h/h		4.5 ped-h/h	769.4 pers-h/l
Desired Speed	40.0 km/h			
Demand Flows (Total for all Sites)	21997 veh/h		342 ped/h	26738 pers/h
Arrival Flows (Total for all Sites)	21496 veh/h		342 ped/h	26137 pers/h
Demand Flows (Entry Total)	7436 veh/h			
Midblock Inflows (Total)	124 veh/h			
Midblock Outflows (Total)	-500 veh/h			
Percent Heavy Vehicles (Demand)	0.0 %			
Percent Heavy Vehicles (Arrival)	0.0 %			
Degree of Saturation	2.344			
Control Delay (Total)	422.68 veh-h/h		2.32 ped-h/h	509.54 pers-h/l
Control Delay (Average)	70.8 sec		24.5 sec	70.2 sec
Control Delay (Worst Lane)	2485.2 sec			
Control Delay (Worst Movement)	2485.2 sec		49.3 sec	2485.2 sec
Geometric Delay (Average)	0.7 sec			
Stop-Line Delay (Average)	70.1 sec			
Queue Storage Ratio (Worst Lane)	1.00			
Total Effective Stops	15805 veh/h		199 ped/h	19165 pers/h
Effective Stop Rate	0.74	1.28 per km	0.58	0.73
Proportion Queued	0.71		0.58	0.72
Performance Index	1254.0		5.6	1259.6
Cost (Total)	22071.26 $/h	1.79 $/km	114.40 $/h	22185.66 $/h
Fuel Consumption (Total)	1631.6 L/h	132.5 mL/km		
Fuel Economy	13.3 L/100km			
Carbon Dioxide (Total)	3834.4 kg/h	311.4 g/km		
Hydrocarbons (Total)	0.379 kg/h	0.031 g/km		
Carbon Monoxide (Total)	3.773 kg/h	0.306 g/km		
NOx (Total)	1.056 kg/h	0.086 g/km		

Network Model Variability Index (Iterations 3 to N): 9.2 %
Number of Iterations: 18 (Maximum: 50)
Largest change in Lane Degrees of Saturation or Queue Storage Ratios for the last three Network Iterations: 0.9% 0.5% 0.2%
Network Level of Service (LOS) Method: SIDRA Speed Efficiency.
Software Setup used: New South Wales.

Network Performance - Annual Values

Performance Measure	Vehicles	Pedestrians	Persons
Demand Flows (Total for all Sites)	10,558,640 veh/y	164,004 ped/y	12,834,380 pers/y
Delay	202,885 veh-h/y	1,115 ped-h/y	244,578 pers-h/y
Effective Stops	7,586,501 veh/y	95,326 ped/y	9,199,128 pers/y
Travel Distance	5,910,355 veh-km/y	4,935 ped-km/y	7,097,361 pers-km/y
Travel Time	305,950 veh-h/y	2,170 ped-h/y	369,310 pers-h/y
Cost	10,594,210 $/y	54,912 $/y	10,649,120 $/y
Fuel Consumption	783,191 L/y		
Carbon Dioxide	1,840,498 kg/y		
Hydrocarbons	182 kg/y		
Carbon Monoxide	1,811 kg/y		
NOx	507 kg/y		

NETWORK SUMMARY

Network: N101 [2026_am_landuse_1_AM_signals_only]

2026_am_landuse_1_AM_signals_only
Network Category: (None)
Network Cycle Time = 75 seconds (Network Optimum Cycle Time - Minimum Delay)

Network Performance - Hourly Values

Performance Measure	Vehicles	Per Unit Distance	Pedestrians	Persons
Network Level of Service (LOS)	LOS F			
Travel Time Index	1.48			
Speed Efficiency	0.23			
Congestion Coefficient	4.28			
Travel Speed (Average)	9.3 km/h		2.7 km/h	9.3 km/h
Travel Distance (Total)	13392.0 veh-km/h		10.3 ped-km/h	16080.7 pers-kn
Travel Time (Total)	1434.6 veh-h/h		3.9 ped-h/h	1725.4 pers-h/l
Desired Speed	40.0 km/h			
Demand Flows (Total for all Sites)	25624 veh/h		342 ped/h	31090 pers/h
Arrival Flows (Total for all Sites)	23259 veh/h		342 ped/h	28253 pers/h
Demand Flows (Entry Total)	8416 veh/h			
Midblock Inflows (Total)	87 veh/h			
Midblock Outflows (Total)	-318 veh/h			
Percent Heavy Vehicles (Demand)	0.0 %			
Percent Heavy Vehicles (Arrival)	0.0 %			
Degree of Saturation	5.392			
Control Delay (Total)	1193.86 veh-h/h		1.68 ped-h/h	1434.31 pers-h/l
Control Delay (Average)	184.8 sec		17.7 sec	182.8 sec
Control Delay (Worst Lane)	7928.6 sec			
Control Delay (Worst Movement)	7928.6 sec		31.8 sec	7928.6 sec
Geometric Delay (Average)	0.7 sec			
Stop-Line Delay (Average)	184.1 sec			
Queue Storage Ratio (Worst Lane)	1.73			
Total Effective Stops	26634 veh/h		215 ped/h	32176 pers/h
Effective Stop Rate	1.15	1.99 per km	0.63	1.14
Proportion Queued	0.74		0.63	0.82
Performance Index	2447.1		5.1	2452.2
Cost (Total)	48503.46 $/h	3.62 $/km	97.95 $/h	48601.41 $/h
Fuel Consumption (Total)	2735.5 L/h	204.3 mL/km		
Fuel Economy	20.4 L/100km			
Carbon Dioxide (Total)	6428.4 kg/h	480.0 g/km		
Hydrocarbons (Total)	0.685 kg/h	0.051 g/km		
Carbon Monoxide (Total)	5.398 kg/h	0.403 g/km		
NOx (Total)	1.491 kg/h	0.111 g/km		

Network Model Variability Index (Iterations 3 to N): 30.2 %
Number of Iterations: 17 (Maximum: 50)
Largest change in Lane Degrees of Saturation or Queue Storage Ratios for the last three Network Iterations: 0.9% 0.7% 0.6%
Network Level of Service (LOS) Method: SIDRA Speed Efficiency.
Software Setup used: New South Wales.

Network Performance - Annual Values

Performance Measure	Vehicles	Pedestrians	Persons
Demand Flows (Total for all Sites)	12,299,350 veh/y	164,004 ped/y	14,923,220 pers/y
Delay	573,053 veh-h/y	804 ped-h/y	688,468 pers-h/y
Effective Stops	12,784,550 veh/y	103,083 ped/y	15,444,550 pers/y
Travel Distance	6,428,169 veh-km/y	4,935 ped-km/y	7,718,738 pers-km/y
Travel Time	688,599 veh-h/y	1,859 ped-h/y	828,178 pers-h/y
Cost	23,281,660 $/y	47,015 $/y	23,328,680 $/y
Fuel Consumption	1,313,032 L/y		
Carbon Dioxide	3,085,625 kg/y		
Hydrocarbons	329 kg/y		
Carbon Monoxide	2,591 kg/y		
NOx	716 kg/y		

NETWORK SUMMARY

Network: N101 [2026_am_landuse_0_PM_signals_only]

2026_am_landuse_0_PM_signals_only
Network Category: (None)
Network Cycle Time = 110 seconds (Network Optimum Cycle Time - Minimum Delay)

Network Performance - Hourly Values

Performance Measure	Vehicles	Per Unit Distance	Pedestrians	Persons
Network Level of Service (LOS)	LOS E			
Travel Time Index	3.83			
Speed Efficiency	0.44			
Congestion Coefficient	2.25			
Travel Speed (Average)	17.8 km/h		2.3 km/h	17.7 km/h
Travel Distance (Total)	12420.1 veh-km/h		10.3 ped-km/h	14914.4 pers-kn
Travel Time (Total)	698.2 veh-h/h		4.5 ped-h/h	842.3 pers-h/l
Desired Speed	40.0 km/h			
Demand Flows (Total for all Sites)	22197 veh/h		342 ped/h	26978 pers/h
Arrival Flows (Total for all Sites)	21659 veh/h		342 ped/h	26333 pers/h
Demand Flows (Entry Total)	7528 veh/h			
Midblock Inflows (Total)	126 veh/h			
Midblock Outflows (Total)	-510 veh/h			
Percent Heavy Vehicles (Demand)	0.0 %			
Percent Heavy Vehicles (Arrival)	0.0 %			
Degree of Saturation	2.567			
Control Delay (Total)	481.11 veh-h/h		2.33 ped-h/h	579.65 pers-h/l
Control Delay (Average)	80.0 sec		24.5 sec	79.2 sec
Control Delay (Worst Lane)	2884.6 sec			
Control Delay (Worst Movement)	2884.6 sec		49.3 sec	2884.6 sec
Geometric Delay (Average)	0.7 sec			
Stop-Line Delay (Average)	79.3 sec			
Queue Storage Ratio (Worst Lane)	1.00			
Total Effective Stops	16126 veh/h		199 ped/h	19550 pers/h
Effective Stop Rate	0.74	1.30 per km	0.58	0.74
Proportion Queued	0.70		0.58	0.72
Performance Index	1329.5		5.6	1335.2
Cost (Total)	24075.14 $/h	1.94 $/km	114.48 $/h	24189.63 $/h
Fuel Consumption (Total)	1713.1 L/h	137.9 mL/km		
Fuel Economy	13.8 L/100km			
Carbon Dioxide (Total)	4025.8 kg/h	324.1 g/km		
Hydrocarbons (Total)	0.401 kg/h	0.032 g/km		
Carbon Monoxide (Total)	3.894 kg/h	0.314 g/km		
NOx (Total)	1.083 kg/h	0.087 g/km		

Network Model Variability Index (Iterations 3 to N): 7.9 %
Number of Iterations: 22 (Maximum: 50)
Largest change in Lane Degrees of Saturation or Queue Storage Ratios for the last three Network Iterations: 0.6% 0.5% 0.3%
Network Level of Service (LOS) Method: SIDRA Speed Efficiency.
Software Setup used: New South Wales.

Network Performance - Annual Values

Performance Measure	Vehicles	Pedestrians	Persons
Demand Flows (Total for all Sites)	10,654,530 veh/y	164,004 ped/y	12,949,440 pers/y
Delay	230,931 veh-h/y	1,117 ped-h/y	278,234 pers-h/y
Effective Stops	7,740,514 veh/y	95,473 ped/y	9,384,089 pers/y
Travel Distance	5,961,651 veh-km/y	4,935 ped-km/y	7,158,917 pers-km/y
Travel Time	335,119 veh-h/y	2,171 ped-h/y	404,314 pers-h/y
Cost	11,556,070 $/y	54,951 $/y	11,611,020 $/y
Fuel Consumption	822,282 L/y		
Carbon Dioxide	1,932,362 kg/y		
Hydrocarbons	193 kg/y		
Carbon Monoxide	1,869 kg/y		
NOx	520 kg/y		

NETWORK SUMMARY

Network: N101 [2026_am_landuse_2_AM_signals_only]

2026_am_landuse_2_AM_signals_only
Network Category: (None)
Network Cycle Time = 75 seconds (Network Optimum Cycle Time - Minimum Delay)

Network Performance - Hourly Values

Performance Measure	Vehicles	Per Unit Distance	Pedestrians	Persons
Network Level of Service (LOS)	LOS F			
Travel Time Index	1.34			
Speed Efficiency	0.22			
Congestion Coefficient	4.53			
Travel Speed (Average)	8.8 km/h		2.7 km/h	8.8 km/h
Travel Distance (Total)	13424.7 veh-km/h		10.3 ped-km/h	16120.0 pers-kn
Travel Time (Total)	1521.1 veh-h/h		3.9 ped-h/h	1829.2 pers-h/l
Desired Speed	40.0 km/h			
Demand Flows (Total for all Sites)	25770 veh/h		342 ped/h	31266 pers/h
Arrival Flows (Total for all Sites)	23295 veh/h		342 ped/h	28296 pers/h
Demand Flows (Entry Total)	8469 veh/h			
Midblock Inflows (Total)	88 veh/h			
Midblock Outflows (Total)	-320 veh/h			
Percent Heavy Vehicles (Demand)	0.0 %			
Percent Heavy Vehicles (Arrival)	0.0 %			
Degree of Saturation	5.647			
Control Delay (Total)	1279.46 veh-h/h		1.67 ped-h/h	1537.02 pers-h/l
Control Delay (Average)	197.7 sec		17.6 sec	195.6 sec
Control Delay (Worst Lane)	8389.2 sec			
Control Delay (Worst Movement)	8389.2 sec		31.8 sec	8389.2 sec
Geometric Delay (Average)	0.7 sec			
Stop-Line Delay (Average)	197.0 sec			
Queue Storage Ratio (Worst Lane)	1.83			
Total Effective Stops	27147 veh/h		214 ped/h	32791 pers/h
Effective Stop Rate	1.17	2.02 per km	0.63	1.16
Proportion Queued	0.75		0.63	0.82
Performance Index	2558.6		5.1	2563.7
Cost (Total)	51334.01 $/h	3.82 $/km	97.83 $/h	51431.85 $/h
Fuel Consumption (Total)	2845.5 L/h	212.0 mL/km		
Fuel Economy	21.2 L/100km			
Carbon Dioxide (Total)	6686.9 kg/h	498.1 g/km		
Hydrocarbons (Total)	0.715 kg/h	0.053 g/km		
Carbon Monoxide (Total)	5.554 kg/h	0.414 g/km		
NOx (Total)	1.527 kg/h	0.114 g/km		

Network Model Variability Index (Iterations 3 to N): 32.4 %
Number of Iterations: 36 (Maximum: 50)
Largest change in Lane Degrees of Saturation or Queue Storage Ratios for the last three Network Iterations: 0.3% 0.0% 0.0%
Network Level of Service (LOS) Method: SIDRA Speed Efficiency.
Software Setup used: New South Wales.

Network Performance - Annual Values

Performance Measure	Vehicles	Pedestrians	Persons
Demand Flows (Total for all Sites)	12,369,760 veh/y	164,004 ped/y	15,007,710 pers/y
Delay	614,140 veh-h/y	802 ped-h/y	737,770 pers-h/y
Effective Stops	13,030,450 veh/y	102,898 ped/y	15,739,440 pers/y
Travel Distance	6,443,876 veh-km/y	4,935 ped-km/y	7,737,586 pers-km/y
Travel Time	730,142 veh-h/y	1,857 ped-h/y	878,027 pers-h/y
Cost	24,640,330 $/y	46,961 $/y	24,687,290 $/y
Fuel Consumption	1,365,836 L/y		
Carbon Dioxide	3,209,715 kg/y		
Hydrocarbons	343 kg/y		
Carbon Monoxide	2,666 kg/y		
NOx	733 kg/y		

NETWORK SUMMARY

Network: N101 [2026_am_landuse_2_PM_signals_only]

2026_am_landuse_2_PM_signals_only
Network Category: (None)
Network Cycle Time = 110 seconds (Network Optimum Cycle Time - Minimum Delay)

Network Performance - Hourly Values

Performance Measure	Vehicles	Per Unit Distance	Pedestrians	Persons
Network Level of Service (LOS)	LOS E			
Travel Time Index	3.73			
Speed Efficiency	0.44			
Congestion Coefficient	2.29			
Travel Speed (Average)	17.4 km/h		2.3 km/h	17.4 km/h
Travel Distance (Total)	12468.7 veh-km/h		10.3 ped-km/h	14972.7 pers-kn
Travel Time (Total)	714.8 veh-h/h		4.5 ped-h/h	862.3 pers-h/l
Desired Speed	40.0 km/h			
Demand Flows (Total for all Sites)	22281 veh/h		342 ped/h	27079 pers/h
Arrival Flows (Total for all Sites)	21731 veh/h		342 ped/h	26419 pers/h
Demand Flows (Entry Total)	7572 veh/h			
Midblock Inflows (Total)	127 veh/h			
Midblock Outflows (Total)	-517 veh/h			
Percent Heavy Vehicles (Demand)	0.0 %			
Percent Heavy Vehicles (Arrival)	0.0 %			
Degree of Saturation	2.635			
Control Delay (Total)	496.82 veh-h/h		2.33 ped-h/h	598.51 pers-h/l
Control Delay (Average)	82.3 sec		24.5 sec	81.6 sec
Control Delay (Worst Lane)	3006.0 sec			
Control Delay (Worst Movement)	3006.0 sec		49.3 sec	3006.0 sec
Geometric Delay (Average)	0.7 sec			
Stop-Line Delay (Average)	81.6 sec			
Queue Storage Ratio (Worst Lane)	1.00			
Total Effective Stops	16210 veh/h		199 ped/h	19650 pers/h
Effective Stop Rate	0.75	1.30 per km	0.58	0.74
Proportion Queued	0.70		0.58	0.72
Performance Index	1348.2		5.6	1353.8
Cost (Total)	24618.43 $/h	1.97 $/km	114.50 $/h	24732.93 $/h
Fuel Consumption (Total)	1736.3 L/h	139.3 mL/km		
Fuel Economy	13.9 L/100km			
Carbon Dioxide (Total)	4080.3 kg/h	327.2 g/km		
Hydrocarbons (Total)	0.408 kg/h	0.033 g/km		
Carbon Monoxide (Total)	3.931 kg/h	0.315 g/km		
NOx (Total)	1.091 kg/h	0.088 g/km		

Network Model Variability Index (Iterations 3 to N): 8.4 %
Number of Iterations: 20 (Maximum: 50)
Largest change in Lane Degrees of Saturation or Queue Storage Ratios for the last three Network Iterations: 0.8% 0.5% 0.3%
Network Level of Service (LOS) Method: SIDRA Speed Efficiency.
Software Setup used: New South Wales.

Network Performance - Annual Values

Performance Measure	Vehicles	Pedestrians	Persons
Demand Flows (Total for all Sites)	10,694,830 veh/y	164,004 ped/y	12,997,790 pers/y
Delay	238,472 veh-h/y	1,117 ped-h/y	287,284 pers-h/y
Effective Stops	7,780,613 veh/y	95,494 ped/y	9,432,230 pers/y
Travel Distance	5,984,984 veh-km/y	4,935 ped-km/y	7,186,917 pers-km/y
Travel Time	343,104 veh-h/y	2,172 ped-h/y	413,896 pers-h/y
Cost	11,816,850 $/y	54,960 $/y	11,871,810 $/y
Fuel Consumption	833,422 L/y		
Carbon Dioxide	1,958,541 kg/y		
Hydrocarbons	196 kg/y		
Carbon Monoxide	1,887 kg/y		
NOx	524 kg/y		

21 June 10:00am

21 June 11:00am

21 June 12:00pm

21 June 1:00pm

21 June 2:00pm

culmination of overshadowing

additional FSR

Overshadowing -
culmination of all overshadowing plus additional FSR

Urban Design September 2020

in relation to infrastructure provision required to support the proposal and that any planning agreement entered into is:
1. in addition to developer contributions payable; and
2. reported to Council prior to public exhibition.

(e) **That** the site-specific DCP and Planning Agreement be publicly exhibited concurrently with the Planning Proposal should Gateway determination be issued.

(f) **That** Council advises the DPIE that the CEO will be not be seeking to exercise its plan-making delegations for this Planning Proposal, as authorised by Council on 26 November 2012.

(g) **Further, that** Council delegates authority to the CEO to correct any minor anomalies of a non-policy and administrative nature that arise during the plan-making process.

The Panel decision was unanimous.

REASONS FOR DECISION

The Panel supports the findings in the report and endorsed the reasons contained in that report.

5.2 SUBJECT PUBLIC MEETING: Gateway Request: Planning Proposal - Increasing Commercial Floorspace in the Epping Town Centre
REFERENCE F2018/03032 -
REPORT OF Team Leader Land Use Planning

The Panel considered the matter listed at Item 5.2, attachments to Item 5.2 and the matters observed at the site inspection

PUBLIC FORUM

- Margaret McCartney speaking against the proposal.
- Mike Moffatt speaking against the proposal.

All the members of this Panel are aware of the extent and nature of development that has occurred in and around the Epping Town Centre for many years and as a result, the Panel understands the need now for intervention by the council as planning authority to reverse what is considered by most, including the members of the Civic Trust who addressed the Panel, to have brought about an unfortunate and serious loss of commercial space in the Town Centre. This has led to the Centre now having the characteristics of a dormitory suburb only, rather than a thriving commercial community with jobs and other employment opportunities otherwise well served by public transport. The report explains that even local existing businesses are struggling to retain their premises especially if leased. Meaningful long term commercial leases are now rare in the centre that once was a busy town centre.

The Panel is persuaded by the report of the council's strategic planning team, and the studies that have been carried out, that the strong measures contained in the Planning Proposal are necessary at this time. It is understood that this will result in greater stress on traffic congestion, taller buildings are likely to occur to encourage the building owner/developer away from the more lucrative residential market, and that there may be subsequent effects on sun loss and wind impact – needing careful scrutiny in assessing those future applications at development approval stage. The Panel notes and supports the requirement for Design Excellence still to be achieved under this Proposal.

Whilst the Panel agrees, nevertheless, to recommend to Council the adoption of Option 3 of the report, it has comments and other recommendations for Council's consideration, as follows:

2111 **DETERMINATION**

That the Local Planning Panel recommend to Council:

(a) **That** Council delegate authority to the Chief Executive Officer to prepare a planning proposal which seeks the following amendments to *Parramatta Local Environmental Plan 2011* and *Hornsby Local Environmental Plan 2013* applying to all land in the B2 Local Centre zone in the Epping Town Centre with the exception of 6 - 14 and 18A Bridge Street and 24-30 High Street relating to Option 3 detailed in this report that:
   i. Introduces a new clause which will limit the ground, first and second floors of any building facing a street to non-residential uses only and ensure a change of use proposed on these levels would not allow residential uses. An exception will be applied to that part of a building that faces a service lane or is required for entrances and lobbies, access for fire services or vehicular access associated with residential accommodation.
   ii. Amends the maximum floor space ratio (FSR) and height of buildings to accommodate additional non-residential uses.

(b) **That** the Chief Executive Officer forwards the Planning Proposal to the Department of Planning, Industry and Environment (DPIE) to request the issuing of a Gateway Determination on behalf of Council.

(c) **That** Council delegate authority to the Chief Executive Officer to prepare amendments to the relevant sections of the Parramatta Development Control Plan 2011 and Hornsby Development Control Plan 2013 to support the Planning Proposal relating to the following design controls, and place these on public exhibition with the Planning Proposal:
   i. podium height controls;
   ii. minimum floorplate dimensions;
   iii. floor to ceiling heights for non-residential uses;
   iv. location of services; and
   v. building and podium setback controls.

(d) **That** Council officers investigate the feasibility of imposing a savings provision clause to set a date by which development that does not achieve the required non-residential floor space will no longer be permitted – to ensure that there will not be a rush by developers to land bank or lodge holding applications to avoid the effects of the proposal;

(e) **That t**he Panel believes a more equitable solution to the amount of additional floor space awarded as bonus should be restricted to not more than 0.5:1 – and if so notes it would bring about some lowering of achievable maximum heights .in some areas of the centre, thereby reducing potential overshadowing and other potential environmental impacts. In this regard, the Panel is advised limiting the additional FSR maximum to 0.5:1 would not compromise the desired outcome of re-establishing a viable commercial base in the centre.

(f) **That a** thorough Review of the proposed changes and their effectiveness should be a commitment written into this Proposal – to be undertaken at, say, no later than 3 years from the commencement of the amended LEP.

(g) **That** Council undertake a campaign to advocate use of Public Transport in and to the Town Centre and to help find new ways to encourage its use over the private car.

(h) **That** Council advises the DPIE that the Chief Executive Officer will be exercising the plan-making delegations for this Planning Proposal as authorised by Council on 26 November 2012.

(i) **Further, that** Council delegate authority to the Chief Executive Officer to correct any minor anomalies of a non-policy and administrative nature that may arise during the plan-making process.

The Panel decision was unanimous.

REASONS FOR DECISION

With the additional recommendations in points (d) to (g) in mind, the Panel will unanimously support the recommendations in the Council report, finding that the proposal has strategic merit and will deal with site specific merit through its specific Development Control Plan and Design Excellence requirements, and otherwise complies with the relevant legislation.

The meeting terminated at 4.19pm.

Chairperson