Interim Traffic Modelling Report

Epping Town Centre

Prepared for City of Parramatta Council | 23 June 2017
Interim Traffic Modelling Report

Report J17056RP2 | Prepared for City of Parramatta Council | 23 June 2017

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Date 23 June 2017

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Document Control

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1 Introduction

EMM Consulting Pty Ltd (EMM) have been commissioned by City of Parramatta Council (Council) to identify the traffic and transport network planning implications arising from the future development of the Epping Town Centre under a range of potential land use scenarios. This will include the effects on regional transport patterns of major infrastructure capacity enhancements such as the $550 million Hills M2 Motorway upgrade, the $8.3 billion North West metro rail line and the arterial road widening which have recently been completed by Roads and Maritime Services (RMS) or are currently in progress, for sections of Beecroft Road and Epping Road adjacent to the Epping Town Centre.

In a transport modelling context, the two primary aims and objectives of the study are:

- to identify the through (regional) traffic volumes and their effect on the traffic network; and
- the quantification of the local area road network impacts from local and through traffic growth.

A range of traffic and land use scenarios are to be tested including seven growth scenarios stemming from the proposed zoning changes implemented as an outcome of the Epping Town Centre Urban Activation Precinct Study (UAP) 2014.

The analysis is further required to review and update the work of the Epping Town Centre Transport Studies by Halcrow and GTA (Halcrow Pacific Pty Ltd, 2011 and GTA Consultants, reviewed by AECOM, 2015) which informed the work of the UAP. The Halcrow Study recommended six road infrastructure treatments to accommodate short term development in the Town Centre and to go some way to accommodate long-term development. Both study recommendations were based upon growth scenarios of approximately 3,000 additional dwelling units.

More recent land capability analysis undertaken for this traffic study has identified the actual future development potential under the new zoning controls is likely to be in the order of 10,000 additional dwellings. The relevance of a proposed future roadworks program for approximately 3,000 additional dwelling units within the core areas of the Epping Town Centre, needs to be re-evaluated.

In particular, this needs to consider the knowledge now, which was not specifically available to Halcrow and GTA while they were undertaking their studies, that during the period 2011 to 2017, an additional total of 4,735 dwelling units have been approved or expected to be delivered within the Epping Town Centre and surrounding areas over the next few years.

1.1 Interim report analysis

This interim traffic analysis has been undertaken to be incorporated in a discussion paper currently being prepared by Council specifically addressing the following key questions:

- Details/assumptions (eg does it factor in proposed future road/traffic improvements such as widening of the Epping Bridge) of the base model

- Analysis of the proposed traffic works identified in the Joint Traffic Study (GTA) ie Victoria Rd extension prepared on behalf of the applicants of the two preliminary planning proposals and whether these works will provide any long term or real improvement to the traffic conditions.

- Preliminary analysis demonstrating whether there are any traffic works that can be carried out that will actually make any real long term improvements.
Details of further work/modelling that still need to be carried out.

As well as the above requirements the following was also required to be considered by Council for their interim report.

- Preliminary findings in term of network/traffic issues under the base scenario and details of how these will be exacerbated once we factor in the development up to the UAP capacity factoring proposed road improvements identified in the Halcrow Report (traffic report accompanying the UAP).

The Halcrow report identified the following local area traffic improvement scenarios.

1. North Epping traffic that currently turns right from Langston Place should be re-directed to Essex Street by banning the right turn for general traffic at Langston Place;

2. To facilitate increased traffic volumes due to the re-routeing from Langston Place, Essex Street/Epping Road intersection should have the pedestrian crossing facility moved to the Eastern side and Essex Street approaches should be widened to accommodate additional turning lanes;

3. Rail bridge carriageway widening is undertaken by removal of footpaths on North and South sides to accommodate additional Westbound lane (Note: the feasibility of this is still subject to RMS and Transport for NSW agreement given engineering constraints and funding implications);

4. New shared pedestrian/cycle bridges are constructed on the North and/or South sides of the existing rail bridge;

5. An additional lane is created on Southern side of Epping Road at approach to Blaxland Road;

6. The Beecroft Road Southbound approach to the Beecroft Road/Carlingford Road intersection is widened to accommodate an additional two lanes (one through lane over a distance of at least 150m and one turning lane over a distance of 50m); and

7. Impacts of rat-running vehicles can be minimised by introducing a median island on Epping Road between Smith Street and Forest Grove and consideration given to banning right turn from Epping Road West to Essex Street South.

The implications of these improvements, given the potential development capacity under the UAP and other development scenarios relate primarily to local traffic and will need to be analysed using the local area traffic model currently being calibrated and audited.

1.2 Traffic models

This study is to rely upon two separate but related traffic models to assess and analyse the regional and local traffic changes respectively. Each local traffic model is effectively a more detailed local area traffic model developed from the regional traffic model.

Both the local and regional models will be relied upon to evaluate in detail the range of traffic network and land use scenarios. At the current time, preliminary investigations regarding the daily traffic volumes and two am peak hour traffic models have been completed, so the interim transport report findings which are the subject of this report are based on the am peak hour traffic conditions only.

The two models are described below.
1.2.1 The Sydney Wide EMME/2 Sydney travel model

The Sydney Wide EMME/2 Network travel model, otherwise known as the Sydney Travel Model (STM), will be used to determine the key north-west to south-east, year 2016/7, year 2026 and year 2036, morning and afternoon peak hour regional traffic movements travelling through the Epping Area on the Carlingford Road, Beecroft Road, Blaxland Road and Epping Road approach routes.

These four roads represent the primary routes for regional through traffic movements in the study area, (refer to Figure 1.1), although, it is acknowledged that the through traffic movements will not necessarily all be confined to these routes, either currently or in the future.

1.2.2 Epping Town Centre local network model

The Epping Town Centre local network traffic model (sometimes referred to as the base model) is currently being built for this project. This model includes approximately 17 intersections and a similar number of nodes for locally generated travel (either one or two for each street block generally).

The local network traffic model area which is shown in outline form in Figures 1.2, will also include the potential additional local road connection to Carlingford Road, via Victoria Street, west of the Epping town centre which will also be evaluated in detail for each of the study traffic network model and land use scenarios.

The local network traffic model using the EMME/2 local area detailed intersection model, is calibrated using a program of peak hour traffic counts at 17 nominated intersections, with additional morning (7-9 am) and afternoon (4-6 pm) peak hourly travel time surveys conducted over two typical weekdays, to provide additional local traffic model validation in terms of journey times.

The future Epping Town Centre study area traffic conditions will be modelled on the basis of the calibrated current year (2016/7) model of the major road network and provisional future time horizons of the years 2026 and 2036 for the future assessment of traffic circulation and traffic congestion impacts within the key streets of the Epping Town Centre.

For each future land use development scenario which is assessed by the local study area network traffic model, the future traffic congestion and queuing at the key intersections can be calculated and the potential effects of queue blocking assessed.

For the key study area intersections where the traffic queues from one intersection can adversely affect other traffic movements (in particular the local traffic access to the major road network), linked intersection traffic analysis will be undertaken by the model to illustrate these effects.
Local study area traffic model network overlaid on map of the town centre

Interim traffic modelling report

Figure 1.2
1.3 Interim analysis options

EMM were asked by Council to undertake an interim analysis of three future traffic infrastructure improvements. The analysis contained in this report provides the findings of this interim analysis including the methodology and assumptions.

The three traffic infrastructure improvements include:

- the potential additional local road connection to Carlingford Road, west of the Epping Town Centre, via Victoria Street as proposed in the Joint Traffic Study (GTA) ie Victoria Rd extension prepared on behalf of the applicants of the two preliminary planning proposals;

- an additional westbound lane on the Epping Road Bridge; and

- a one way CBD by pass as proposed by the RMS.

This interim analysis provides some early insights into the efficiency of the three proposed improvements for the key ‘pinch point’ intersections in the study area, which are at:

- Beecroft and Carlingford Roads;

- Epping and Blaxland Roads with Langston Place, and.

- Carlingford Road, Rawson Street and Ray Road.

At these three locations there will potentially be cumulative impacts from future regional through traffic growth in addition to the locally generated traffic, which will require the combined consideration of future peak hour regional traffic growth from through traffic and the traffic travelling to and from future destinations within the Epping town centre.

As this initial analysis has been undertaken using the STM, and not the local base network base model which is still currently being calibrated and audited, the analysis can primarily only indicate the potential impacts on regional through traffic.

However, commentary is also provided where relevant on the likely impacts for local traffic as a result of the proposed changes and updated year 2017 SIDRA intersection analysis results have also been prepared by EMM based on the most recent actual peak hour intersection traffic surveys which were undertaken in March 2017 and the SIDRA 7 intersection model which models the co-ordinated operation of a chain of linked intersections.
2 Current traffic conditions

2.1 Road network

The main regional road in the area immediately surrounding the study area is the M2 Motorway which runs adjacent to the northern boundary of the study area. The study contains a number of arterial roads, including Epping Road and Carlingford Road which run in an east-west direction and Beecroft Road and Blaxland Road which run in a north-south direction. These roads provide access through the study area. The study area also contains a number of collector roads which connect between arterial roads and local roads.

2.2 Existing traffic conditions

The Epping Town Centre Study (JBA Planning 2011) underpinned the rezoning of 54 hectares of land for thousands of new homes in the Epping Town Centre as part of the Urban Activation Precinct. This study relied upon the Epping Town Centre Transport Study Outcomes Report (Halcrow Pacific Pty Ltd 2011).

This report highlighted a number of key issues and findings with traffic in the study area in 2011. This included:

- high volumes of traffic travelling through the study area occurring primarily along Epping Road, Beecroft Road, Carlingford Road and Blaxland Road;
- a high proportion (89%) of trips over the rail overpass bridge during peak periods is through traffic;
- significant traffic delays occurring in both the am and pm peaks;
- 12 minutes to travel through Epping Town Centre from west to east during peak hours and 9 minutes to travel from north to south. This is compared with around 2.5 minutes to travel through the area in either an east-west or north-south direction outside of peak hours; and
- the traffic delays during peak periods result in long traffic queues and congestion along arterial roads. Significant delays are caused by bottlenecks in the road network at the Epping Road, Blaxland Road and Langston Place intersection and the Beecroft Road, Carlingford Road intersection.

The Halcrow report identified the following local area traffic improvement scenarios.

- North Epping traffic that currently turns right from Langston Place should be re-directed to Essex Street by banning the right turn for general traffic at Langston Place;
- To facilitate increased traffic volumes due to the re-routeing from Langston Place, Essex Street/Epping Road intersection should have the pedestrian crossing facility moved to the eastern side and Essex Street approaches should be widened to accommodate additional turning lanes;
- Epping Road Rail bridge carriageway widening is undertaken by removal of footpaths on north and south sides to accommodate additional westbound lane;
- New shared pedestrian/cycle bridges are constructed on the north and/or south sides of the existing rail bridge;
• An additional lane is created on the southern side of Epping Road at the approach to Blaxland Road;

• The Beecroft Road southbound approach to the Beecroft Road/Carlingford Road intersection is widened to accommodate an additional two lanes (one through lane over a distance of at least 150m and one turning lane over a distance of 50m); and

• The impacts of rat-running vehicles can be minimised by introducing a median island on Epping Road between Smith Street and Forest Grove and consideration given to the banning of right turn movements from Epping Road West to Essex Street South.

Of these improvements, only the widening of the Beecroft Road southbound lanes has commenced. The implications of these improvements, given the potential development capacity under the UAP and other development scenarios relate primarily to local traffic and will need to be analysed using the local area traffic model which is currently being calibrated and audited.

2.3 Recent changes in existing traffic conditions

Anecdotally it has been observed from the most recent travel time surveys which have been undertaken for this report in early 2017, that since the 2011 Halcrow traffic report analysis was completed, the morning peak hour through traffic travel times, for the regional through traffic which is travelling through the Epping Town Centre area, have increased as follows to:

• 15 minutes for the regional traffic travelling from west to east during the morning peak period 7-9 am and

• 12 minutes for the regional traffic travelling from north to south, during the morning peak period 7-9 am.

Also, the morning peak hour intersection traffic delays, as measured by a variety of intersection traffic modelling programs have continued to increase steadily since 2011.

This is summarised by the following comparison of the intersection traffic analysis results from the Halcrow and GTA reports and the most recent EMM interim traffic analysis in 2017, which is presented in Table 2.1. The most recent year 2017 SIDRA intersection analysis results which have been prepared by EMM are based on actual peak hour intersection traffic surveys which were undertaken in March 2017 and the SIDRA 7 intersection model which models the co-ordinated operation of a chain of linked intersections.

<table>
<thead>
<tr>
<th>Intersection location</th>
<th>Halcrow 2011 Average traffic delay (seconds)</th>
<th>Level of Service</th>
<th>GTA 2014 Average traffic delay (seconds)</th>
<th>Level of Service</th>
<th>EMM 2017 Average traffic delay (seconds)</th>
<th>Level of Service</th>
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<tr>
<td>Beecroft Road/Carlingford Road</td>
<td>106</td>
<td>F</td>
<td>202</td>
<td>F</td>
<td>542</td>
<td>F</td>
</tr>
<tr>
<td>Epping Road/Blaxland Road</td>
<td>66</td>
<td>E</td>
<td>51</td>
<td>D</td>
<td>184</td>
<td>F</td>
</tr>
<tr>
<td>Carlingford Road/Rawson Street</td>
<td>47</td>
<td>D</td>
<td>108</td>
<td>F</td>
<td>178</td>
<td>F</td>
</tr>
<tr>
<td>Epping Road/Essex Street</td>
<td>78</td>
<td>F</td>
<td>Not included-</td>
<td>336</td>
<td>F</td>
<td></td>
</tr>
<tr>
<td>Epping Road/Pembroke Street</td>
<td>33</td>
<td>C</td>
<td>Not included-</td>
<td>64</td>
<td>E</td>
<td></td>
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</table>
2.4 Reasons for recent traffic changes

The continuing deterioration in the peak hour network traffic performance and the intersection traffic delays for the key intersections since 2011, which is presented in Table 2.1, is concerning but also appears to have occurred without any corresponding overall growth in the total daily traffic volumes which are using the Epping Road route.

In terms of the published RMS daily traffic volumes, there has been virtually no change in the average annual daily traffic (AADT) volume using the Epping Bridge between 2012 and 2016. There was actually a small reduction in the overall AADT volume at the bridge from 56,089 in 2012 to 55,247 in 2016.

In this context, the higher recent traffic delays for the regional through traffic and higher average traffic delays at the key intersections on both Carlingford Road and Epping Road, in particular for the morning peak hour peak direction, for the west to eastbound traffic flow, is indicative of increasingly over saturated traffic conditions for the major road network currently.

This trend is illustrated by the chart in Figure 2.1 which shows the increasingly non-linear trend with intersection traffic delays, where traffic volumes approach and exceed the saturation capacity limit for the intersection, where disproportionately high increases in the intersection traffic delays occur with very little or no increases in the actual intersection throughput traffic volumes, due to the combination of traffic flow congestion, queue blocking and grid-lock effects for traffic at adjacent intersections.

![Figure 2.1](image)

**Figure 2.1** Future intersection delay trend with increasing traffic volumes

This situation is also illustrated by the standard traffic flow vs speed curve for typical major roads, which is shown by the chart in Figure 2.2. Where oversaturated traffic conditions occur there can actually be a decrease in the peak hourly throughput of traffic volumes using the road, due to the traffic flow congestion and grid lock effects which are described above.
These increasing traffic delay effects are now occurring on Epping Road and the increasing volumes of locally generated traffic from recent new developments in both the Epping Town Centre and the adjoining residential precincts close to Carlingford Road and Epping Road, are now attempting to increase the overall major road traffic volumes, with consequent adverse traffic delays for the group of major road intersections which is located near the Epping Bridge.

These intersections and the four major traffic routes (via Epping Road, Beecroft Road, Carlingford Road and Blaxland Road) are all operating at over saturated traffic levels currently for both the morning and afternoon peak hour peak direction traffic flow movements. The increased intersection traffic delays are already probably displacing some of the previous regional through traffic movements away from the Epping Town Centre to other parallel traffic routes such as the M2 Motorway for east west traffic and Midson Road for north south traffic.

The increasing road traffic congestion which is now occurring in the Epping Town Centre area, is effectively displacing regional through traffic movements by increased local traffic movements and potentially very little further traffic growth can now actually occur in the overall daily traffic movements which are travelling through the area without significant capacity improvements to the Epping Bridge and the adjacent group of major road intersections.
3 Interim options analysis

Given the local area traffic model is still to be calibrated and audited the three proposed traffic improvements have only been modelled using the STM. The STM has been used to obtain “orders of magnitude” numbers, and the “headline” findings for each of the three options.

The land use scenario utilised in the modelling is referred to as the “base case” scenario which reflects current development, population and mode split as of June 2016. The base case does not take into consideration any development currently approved or under construction within the Epping Town Centre.

3.1 Base case for traffic model

The base case for the local traffic model provides a forecast of the existing traffic conditions in the study area. The base case for the model is the Bureau of Transport Statistics (BTS) JTW Explorer. The JTW Explorer is based on 2011 Census data and population and employment projections for the study area. The JTW Explorer data is provided in travel model zones termed traffic zones. There are seven traffic zones within the Epping Town Centre study area as shown in Figure 3.1.

Table 3.1 shows the actual 2011 population, and the BTS 2016, 2026 and 2036 population forecast and the forecast population growth effectively, for each of the travel zones which are in the study area (refer Figure 3.1) These population growth figures are the default population growth figures, which correspond more closely to a future low range (+3,000 dwellings) development scenario for the Epping Town Centre and surrounding precincts study area, compared to the more recently identified higher range development scenarios, for up to +10,000 dwellings.

Table 3.1 Future base case (low range) population growth scenario for Epping Town Centre

<table>
<thead>
<tr>
<th>Travel zone (Figure 3.1)</th>
<th>Population 2011</th>
<th>Population 2016</th>
<th>Population 2026</th>
<th>Population 2036</th>
<th>Increase 2011-16</th>
<th>Increase 2011-26</th>
<th>Increase 2011-36</th>
</tr>
</thead>
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<tr>
<td>1409</td>
<td>3,784</td>
<td>3,869</td>
<td>4,143</td>
<td>4,493</td>
<td>85</td>
<td>359</td>
<td>709</td>
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<tr>
<td>1408</td>
<td>2,417</td>
<td>2,480</td>
<td>3,574</td>
<td>4,199</td>
<td>63</td>
<td>1,157</td>
<td>1,782</td>
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<td>1,437</td>
<td>2,661</td>
<td>3,371</td>
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<td>1,228</td>
<td>1,938</td>
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<td>1407</td>
<td>531</td>
<td>535</td>
<td>543</td>
<td>555</td>
<td>4</td>
<td>12</td>
<td>24</td>
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<tr>
<td>1404</td>
<td>2,395</td>
<td>2,468</td>
<td>3,702</td>
<td>4,404</td>
<td>73</td>
<td>1,307</td>
<td>2,009</td>
</tr>
<tr>
<td>1402</td>
<td>1,014</td>
<td>1,019</td>
<td>1,029</td>
<td>1,043</td>
<td>5</td>
<td>15</td>
<td>29</td>
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<tr>
<td>1403</td>
<td>3,031</td>
<td>3,109</td>
<td>4,221</td>
<td>4,896</td>
<td>78</td>
<td>1,190</td>
<td>1,865</td>
</tr>
<tr>
<td>All Zones</td>
<td>14,605</td>
<td>14,917</td>
<td>19,874</td>
<td>22,962</td>
<td>312</td>
<td>5,269</td>
<td>8,357</td>
</tr>
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</table>

In the recent past, very little population growth (only 312 persons) was historically forecast to occur for the Epping Town Centre for the period from 2011-2016, but the forecast population growth rate beyond 2016 was projected to increase more rapidly with an anticipated +8,357 additional persons living in the Town Centre area by 2036.

This (low range) population growth forecast, in comparison to the base year 2011 actual population of 14,605 persons represents an overall average population increase of + 57% over the entire town centre.

The BTS additional population growth forecast for the study area of +8,357 additional persons, corresponds to the future development of 3,750 additional dwellings at an average occupancy rate of 2.23 additional persons per dwelling.
Trafic zones in the study area

Epping Town Centre traffic and land use options analysis
Interim traffic modelling report

Figure 3.1
3.2 Distribution of additional generated traffic

The future distribution of the additional generated traffic from predominantly residential development in the Epping Town Centre study area has been summarised in the GTA report and is effectively over 60% travelling via the Epping Bridge, either to or from the east, in the respective morning and afternoon peak hourly traffic periods. This future traffic distribution is summarised in Table 3.2.

<table>
<thead>
<tr>
<th>Traffic route</th>
<th>Outbound am peak %</th>
<th>Inbound pm peak %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Epping Road east</td>
<td>42</td>
<td>41</td>
</tr>
<tr>
<td>Blaxland Road east</td>
<td>25</td>
<td>20</td>
</tr>
<tr>
<td>Beecroft Road north</td>
<td>12</td>
<td>15</td>
</tr>
<tr>
<td>Carlingford Road west</td>
<td>11</td>
<td>13</td>
</tr>
<tr>
<td>Boronia Avenue west</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Ray Road north</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Chesterfield Road</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

This future traffic distribution is also illustrated by the morning peak hour ‘select link’ traffic flow analysis diagram in Figure 3.2 which has been produced by the STM am peak model, which clearly shows that the majority of the traffic using Rawson Street in the northbound direction is heading east and crossing over the railway line at the Epping Bridge.

Figure 3.2 Select link traffic flow diagram for Rawson Street morning peak traffic northbound
3.3 Westbound lane on the Epping Road Bridge

The Halcrow Study (2011) proposed a “rail bridge carriageway widening be undertaken by removal of footpaths on the north and south sides to accommodate one additional westbound lane”.

![Proposed additional lane on Epping Road Bridge](image)

**Figure 3.3 Proposed additional lane on Epping Road Bridge**

The STM morning peak hour trips that use the bridge westbound currently have been extracted and are shown in Figures 3.4 and 3.5 below.

This type of analysis is often referred to as “select link” analysis. The STM program shows the origins and destinations of the trips that use the identified link. In an additional refinement to the analysis, it shows the separation of the “local” trips from the “through” trips. The two extracted figures show two types of trips:

- “long” trips travel over both selected links which are shown in the yellow colour; and
- “short” trips are shown in the blue colour.

From the strategic model plots shown in the figures above, it is clear that the majority of the trips that currently use the Epping Bridge in the westbound direction are “through trips. About a third of this traffic travels through to the north of the Epping Town Centre via Beecroft Road, and half travels along Carlingford Road. Some of the remaining traffic travels south, and the remaining traffic finishes within the western side of the Epping Town Centre.

The light blue coloured bands show the local traffic on the eastern side of the town centre. This proportion of traffic is also very small compared to the through traffic.
Figure 3.4  Select link analysis for Epping Bridge westbound traffic

Origins and destinations of trips that use the westbound land on the Bridge. These appear to be predominantly “through trips” (long trippers)

Figure 3.5  Close up of select link analysis for Epping Bridge westbound traffic

Origins and destinations of trips that use the westbound land on the Bridge. These appear to be predominantly “through trips” (long trippers)
3.3.1 Impact of the additional westbound lane

If an additional westbound traffic lane is put onto the Epping Bridge, the westbound path would become more attractive for westbound traffic and would therefore attract more trips from parallel paths such as the M2 Motorway.

However, this effect would primarily only occur during the afternoon peak hour traffic periods, when the peak traffic flow is westbound and the additional traffic capacity on the bridge would provide the greatest benefits, subject to similar additional traffic capacity also being provided elsewhere on the road network immediately to the east and the west of the Bridge, to enable the additional bridge westbound traffic capacity to be fully utilised.

Also, although this has not formally been specifically requested by the City of Parramatta Council or RMS to be specifically investigated by this study, the provision on one additional traffic lane would open up more options potentially for the bridge to operate with tidal flow traffic conditions such as four lanes eastbound during the morning peak hours with two lanes westbound and three lanes in each direction during the afternoon peak periods.

This type of future tidal flow traffic arrangement would potentially enable a single lane of additional traffic capacity at the bridge to operate with additional peak hour capacity for both the morning peak hour eastbound and the afternoon peak hour westbound traffic flows.

3.3.2 Confirmation of additional local area traffic improvements

Currently, the bridge has two lanes in the western direction. The traffic comes from three approaches, and each of these three approaches currently has two-lanes, which is shown in Figure 3.6.

However, the RMS has approval for, and has recently commenced the construction of one additional traffic lane on Epping Road, travelling westbound between Essex Street and Blaxland Road. This additional westbound traffic lane will provide most of the necessary additional traffic capacity for the main bridge approach westbound traffic flow (which is from Epping Road further east) to effectively fully utilise the additional afternoon peak hour westbound traffic capacity provided at the bridge.

![Figure 3.6 Existing approaches to the Epping Bridge](image)
Similarly, for Bridge Street through the Epping Town Centre west of the bridge, further consideration also needs to be given to increasing the traffic capacity for this route to also accommodate the additional peak hourly westbound traffic movements which would also be using the bridge, where only two lanes are available currently for this traffic to continue northwards via Beecroft Road.

3.4 One way CBD bypass for westbound traffic

One potential option for improving the road capacity for westbound traffic, west of the Epping Bridge is for increasing the traffic capacity of the Bridge Street and Kent Street routes, as part of a one-way CBD traffic bypass route around the Epping Town Centre, see Figure 3.7. This option would provide for general traffic circulation to loop around the CBD in a clockwise direction, either with or without the restriction of all future traffic flow using Beecroft Road in a northerly direction between Bridge Street and Carlingford Road.

Figure 3.7 Potential one way CBD bypass traffic route, including rat-run via Rawson Street

This one way CBD Bypass option potentially significantly impacts the existing northbound “through traffic” trips which are currently using Beecroft Road in a northbound direction. These trips would potentially now have to travel “around the block”, which would significantly increase their travel times and travel distances.

Also a significant amount of this traffic would attempt to transfer onto other “rat-run” shorter paths, such as northbound via Rawson Street or via the proposed Victoria Street extension if it is constructed.

In Figure 3.8, the potential traffic changes for the one way bypass option which have been calculated by the STM model are shown assuming this route fully replaces the existing northbound traffic flow via Beecroft Road and specific traffic engineering measures are put in place to ensure that northbound “through traffic” trip do not “rat-run” via either Rawson Street or the Victoria Street extension.
In principle the proposed one way CBD bypass route via Bridge Street and Kent Street is considered to potentially have some merit on the basis that it is implemented in addition to rather than instead of the existing major road northbound traffic route via Beecroft Road.

The reason for this is effectively the future local traffic benefits including improved local traffic accessibility for most areas of the Epping Town Centre, will effectively be counteracted by the additional detoured traffic delays for the northbound traffic which is currently travelling northbound via Beecroft Road, if this route is made one way southbound.

3.5 Victoria Road extension

At a strategic level, the proposed Victoria Street extension, which is shown in Figure 3.9, would provide an additional northbound traffic route between Bridge Street and Carlingford Road primarily for "local trips" which would be travelling either to or from the Epping Town Centre. The future Victoria Street extension route as shown in Figure 3.9 was strongly recommended by the future traffic investigations for the Epping Town Centre undertaken by the GTA report, where it was effectively considered an essential component of all their three future Epping Town Centre traffic network scenarios which were analysed.

In principle the future effect of the Victoria Street extension on the future Epping Town Centre travel paths and the traffic capacity for local traffic movements will be to effectively double the egress traffic capacity for the town centre traffic which currently exists via Rawson Street for access to Carlingford Road and across Carlingford Road to other areas north of Epping. The future traffic movements which would be using the Victoria Street extension during the morning peak hour would be primarily residential traffic with traffic movements similar to those which are shown for Rawson Street in Figure 3.2. At other times of the day and on weekends, the traffic movements would be primarily commercial traffic with traffic movements similar to those which are shown for Rawson Street in Figure 3.10.
Figure 3.9  Proposed Victoria Street extension and connection to Carlingford Road

Figure 3.10  Select link traffic flow diagram for Rawson Street morning peak southbound traffic
The future construction of the Victoria Street extension would clearly benefit the local traffic capacity for additional future local access for the additional traffic which would be travelling to or from the Epping Town Centre, with the major proposed residential and residential/commercial developments in that area.

However, in terms of regional traffic capacity, there would generally be either no change or only minor improvements, unless the proposal was implemented in combination with other measures such as the proposed additional lane on the Epping Bridge, which would also relieve the existing serious major road network capacity constraint at the Epping Bridge and the other identified major road intersections near the bridge, such as Epping Road/Blaxland Road/Langston Place and Beecroft Road/Carlingford Road.
4 Conclusions

This interim analysis of the existing (year 2017) traffic situation and three proposed traffic improvements for the Epping Town Centre has identified some key findings that will assist in the future analysis of both land use and transport scenarios for the Epping Town Centre.

The analysis of existing major road intersection delays is based on the most recent actual peak hour intersection traffic surveys which were undertaken in March 2017 and the SiDRA 7 intersection model which models the co-ordinated operation of a chain of linked intersections.

The interim analyses of three future traffic network options has been taken using the morning peak hour traffic volumes only for the STM and the analysis would potentially be better informed by including additional further analysis of the afternoon peak hour traffic volumes of each scenario, when time permits.

Subject to this qualification, the key findings of preliminary investigations are:

- Four key intersections on the four major traffic routes (via Epping Road, Beecroft Road, Carlingford Road and Blaxland Road) are all operating at over saturated traffic levels currently (in March 2017) for both the morning and afternoon peak hour peak direction traffic flow movements. The increasing road traffic congestion which is now occurring in the Epping Town Centre area, is effectively displacing regional through traffic movements by increased local traffic movements and potentially very little further traffic growth can now actually occur in the overall daily traffic movements which are travelling through the area without significant capacity improvements to the Epping Bridge and the adjacent group of major road intersections.

- The provision of one additional lane westbound on the western side of Epping Bridge will primarily only benefit the afternoon peak hour westbound regional traffic movements which are travelling through the Epping Town Centre. However, potentially if the bridge were to operate with future tidal flow traffic conditions such as four lanes eastbound during the morning peak periods with two lanes westbound and three lanes in each direction during the afternoon peak periods, this future improvement could provide significant travel flow benefits during both these peak periods.

- The potential one way CBD bypass route for northbound traffic via Bridge Street and Kent Street would extend the trip lengths and journey times for northbound through traffic making it unattractive and/or encouraging users to find faster shorter routes. This option would impact on local area traffic movements also and would require specific traffic measures to prevent rat run traffic movements through local streets.

- The future construction of the Victoria Street extension has been strongly recommended by the GTA report network traffic analysis and would clearly benefit the local traffic capacity for providing additional future local access traffic capacity for the additional traffic which would be travelling to or from the Epping Town Centre, with the major proposed residential and residential/commercial developments in that area. However in terms of regional traffic capacity, there would generally be either no change or only minor improvements, unless the proposal was implemented in combination with other traffic capacity improvements at the Epping Bridge.
4.1 Ultimate development

The interim analysis has identified that the potential traffic network implications of growth in the Epping Town Centre effectively need to be reviewed for two different levels of proposed development and also to included the background growth in through traffic trips related to changes outside the Epping study area:

- Future traffic analysis is required to review and update the work of the Epping Town Centre Transport Studies by Halcrow and GTA (Halcrow Pacific Pty Ltd, 2011 and GTA Consultants, reviewed by AECOM, 2015) which informed the work of the UAP. The Halcrow Study recommended six road infrastructure treatments to accommodate short term development in the Town Centre and to go some way to accommodate long-term development. Both study recommendations were based upon growth scenarios of approximately 3,000 additional dwelling units.

- More recent land capability analysis undertaken by City of Parramatta Council informing this traffic study has identified the actual future development potential under the new zoning controls is likely to be in the order of 10,000 additional dwellings. The relevance of the proposed future roadworks programs which have been determined by both the Halcrow and GTA studies for approximately 3,000 additional dwellings, within the core areas of the Epping Town Centre, now needs to be re-evaluated.

It is perhaps unfortunate timing for both the Halcrow and GTA studies, that while these studies were undertaken during the period 2011 to 2015, current development application activity now indicates the likely delivery of 4,735 residential units (as at June 2017) over the next few years.

It is difficult to escape making the conclusion that while the methodology and findings of both studies are effectively sound in terms of their traffic analysis and their identification of a combined future roadworks program to accommodate the additional local area traffic movements which would be generated by 3,000 additional dwelling units in the Epping area, the same roadworks program would also effectively apply to the additional dwelling units (detailed above) which have resulted from a high level of development activity not envisaged or anticipated by the previous traffic studies.

Effectively a new baseline traffic situation exists for the Epping Town Centre, given the higher than expected recent development take up rate. In this context the future combined roadworks programs for the area, will need to be re-evaluated.

Separate further traffic investigations are now therefore required for the new baseline dwelling numbers at Epping, in combination with the other more recently identified potential dwellings growth which has been identified by the City of Parramatta Council land capability analysis, which forms part of a future ultimate residential growth strategy of approximately 10,000 additional dwellings for the Epping Town Centre and adjoining areas.
References


Epping Town Centre Transport Study Outcomes Report Halcrow Pacific Pty Ltd 2011

JBA Planning 2011, Epping Town Centre Study. Report prepared by JBA Urban Planning Consultants Pty Ltd

Proposed Epping Town Centre Redevelopment, Rawson Street Epping, Traffic Study by GTA, reviewed by AECOM, November 2015