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23 June 2017

P0797 PCB Rayford Street Warners Bay Residential Subdivision

Pulver Cooper & Blackley
98 Lawes Street
East Maitland NSW 2323

Attn: Liam Buxton

Dear Liam,

Proposed Rezoning - Residential Subdivision, Warners Bay, NSW.

Further to your email and following our site visit and review of the documentation provided for the proposed rezoning and residential subdivision at Warners Bay, NSW, we provide the following traffic impact statement. This assessment has been prepared in accordance with the Austroads Guidelines and Section 2.3 of the RTA Guide to Traffic Generating Developments which provides the structure for the reporting of key issues to be addressed when determining the impacts of traffic associated with a development. This guide indicates that the use of this format and checklist ensures that the most significant matters are considered by the relevant road authority.

The report has also taken into consideration the planning requirements outlined within the Lake Macquarie Development Control Plan 2014 and the Lake Macquarie Local Environment Plan 2014.

The subject site is located to the west of Rayford Street, Warners Bay as shown in Figure 1. It consists of two adjoining properties located at 40 Rayford Street and 19 Daydawn Avenue.

The surrounding land use consists of predominately low and medium density residential housing with Warners Bay Private Hospital being located at the eastern end of Rayford Street.



Figure 1 - Project area within the context of the local road network (Source: Google Maps).

The site is currently zoned E2 Environmental Conservation with the southern corner being zoned R2 Low Density Residential as shown in Figure 2.

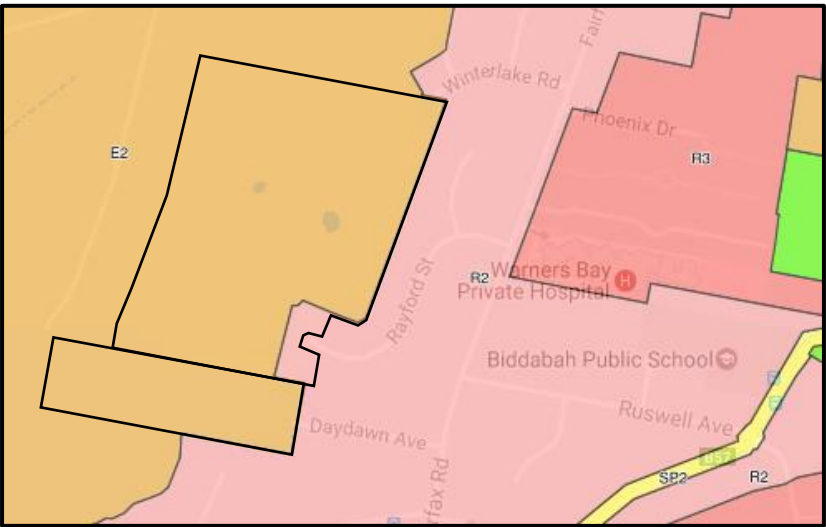


Figure 2 –Land Zoning (as per the Lake Macquarie Local Environment Plan).

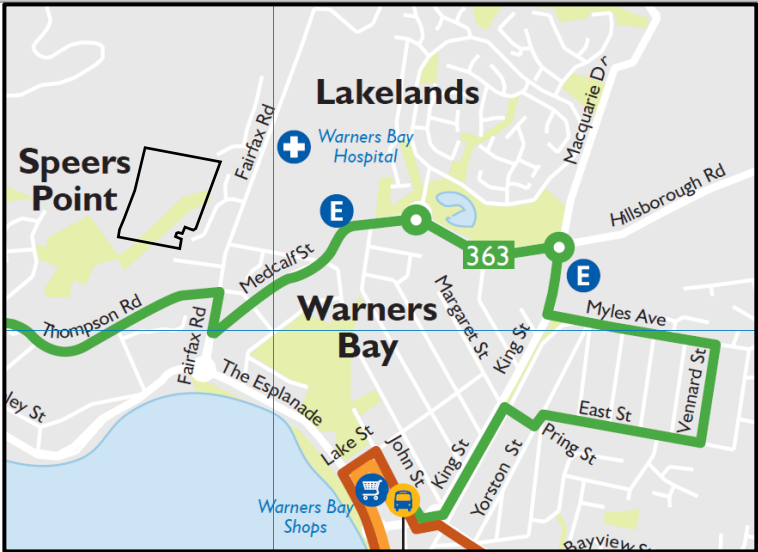
Traffic Impact Assessment:

Item	Comment
Existing Situation	
2.1.1 Site Location and Access	<p>The subject site consists of two adjoining properties at 40 Rayford Street, and 19 Daydown Avenue, Warners Bay as shown in Figure 1.</p> <p>Access is currently provided via an unsealed access driveway at the western end of Rayford Street. No vehicle access is currently provided from Winterlake Road or Daydown Avenue.</p>
2.2.1 Road Hierarchy	<p>Medcalf Street (MR674) is the major road through the locality. It forms part of the regional road network providing a north-south connection from Lake Macquarie through Warners Bay and beyond to the Newcastle Inner City Bypass and Charlestown. In the vicinity of the subject site it provides a sealed pavement in the order of 12 metres wide, allowing for a single lane of travel in each direction with kerbside parking along both sides. Pedestrian footpaths and street lighting are provided along its length. The posted speed limit along Medcalf Street is 60 km/hr although school zones apply between Ruswell Avenue and Lakelands Drive.</p> <p>At its southern end Medcalf Street becomes Fairfax Road (south) before continuing south to connect with The Esplanade via a signalised T-intersection. At its intersection with Fairfax Road, Medcalf Street connects via a 'Give Way' controlled T-intersection which allows for all turning movements. A left slip lane is provided on the southern approach which allows for through movements along Fairfax Road (between the southern and northern sections).</p> <p>To the north Medcalf Street connects with Hillsborough Road and Main Road at a two lane circulating roundabout.</p> <p>Fairfax Road is a local collector road which provides the major road connection between the subject site and nearby residential developments to the regional road network in the south (Fairfax Road and The Esplanade). It provides a sealed pavement in the order of 10 metres wide allowing for a single lane of travel in each direction with kerbside parking to both sides. Street lighting is provided and there is a pedestrian footpath within the eastern verge along the majority of its length. Fairfax Road operates under the posted speed limit of 50 km/hr however there is a 40 km/hr school zone to the north of Rayford Street and south of Ruswell Avenue.</p> <p>While previously operating as a No-Through Road, recent developments at the northern end of Fairfax Road have allowed for separate connection through to the regional road network via Lakelands Drive.</p> <p>Ruswell Avenue is a local road with a sealed pavement in the order of 7-8 metres wide allowing for a single lane of travel in each direction. There are 'No Stopping' zones along the length of Ruswell Street which restrict kerbside parking during the morning and afternoon on school days. There is a shared pathway along the northern side of the road and street lighting is provided along its length.</p>

Item	Comment
	<p>Ruswell Avenue connects with Fairfax Road via a 'Give Way' controlled T-intersection which allows for all turning movements.</p> <p>To the east, Ruswell Avenue connects with Medcalf Street at a 'Stop Sign' controlled T-intersection. Medcalf Street has priority and allows for both turns into Ruswell Avenue with connection to Medcalf Street restricted to northbound only.</p> <p>Rayford Street is a local road in the order of 7-8 metres wide allowing for a single lane of travel in each direction. Kerbside parking is restricted along the northern side of the road between Fairfax Road and Peachwood Close. Pedestrian footpaths are inconsistent along the length of Rayford Street although street lighting is provided.</p> <p>Rayford Street connects with Fairfax Road via a priority controlled T-intersection which allows for all turning movements. Fairfax Road has priority.</p> <p>Winterlake Road is a local road in the order of 10-11 metres wide allowing for a single lane of travel with kerbside parking to both sides. Street lighting is provided and there are pedestrian footpaths located to both sides along its length.</p> <p>Winterlake Road connects with Fairfax Road via a priority controlled T-intersection with Fairfax Road having priority, which allows for all turning movements.</p> <p>Daydawn Avenue is a local road in the order of 7-8 metres wide allowing for a single lane of travel in each direction. Street lighting is provided and there are opportunities for kerbside parking. No pedestrian footpaths are provided.</p> <p>Daydawn Avenue connects with Fairfax Road via a priority controlled T-intersection with Fairfax Road having priority, which allows for all turning movements.</p> <p>The surrounding roads are all local roads under the control of Lake Macquarie City Council.</p>
2.2.2 Roadworks	No roadworks planned or ongoing in the locality.
2.2.3 Traffic Management Works	No significant traffic management works planned or ongoing in the locality.
2.2.4 Pedestrian and Cycling Facilities	<p>There is a shared pathway to the east of the site which extends east along Ruswell Avenue and north along Medcalf Street to connect with existing on-road cycling facilities to the east of Lakelands Drive. A shared pathway also runs along the Lake Macquarie foreshore to the south of the site. While there are no cycling facilities provided along Fairfax Road nor any of the side roads which access the site, cyclists can ride along the local roads to connect with the existing cycling facilities to the north and south of the site.</p> <p>Pedestrian footpaths are inconsistent along Rayford Street with a short section of pathway provided to the eastern side of the street only. Pedestrians can walk along the verge to connect with the existing pathways along Fairfax Road and the shared pathway on Ruswell Avenue.</p>

Item	Comment
	<p>Footpaths are provided along both sides of Winterlake Road.</p> <p>No footpaths are provided along Daydawn Avenue although pedestrians can walk along the grass verge as required.</p>
2.3 Traffic Flows	
2.3.1 Daily Traffic Flows	<p>As part of the project work, Seca Solution collected traffic data at the intersection of Rayford Street and Fairfax Road to determine the current operation and traffic volumes along these roads. This survey was completed during the morning (7:30am to 9:30am) on Tuesday, 7th February 2017.</p> <p>The current peak hour flows (8:15am to 9:15am) along Fairfax Road (south of Rayford Street) were 223 vehicles per hour, split between 60% northbound and 40% southbound. Traffic flows along Rayford Street were significantly lower with 54 vehicles during the morning peak, split between 57% inbound and 43% outbound.</p> <p>It was noted that a large percentage of these vehicles were associated with the Warners Bay Private Hospital with many of these vehicles turning into Rayford Street to look for a park space.</p> <p>Advice from the RMS Guidelines indicate that peak hour flows typically represent around 8-12% of the daily traffic flows. As such the daily flows along Fairfax Road (south of Rayford Street) could be in the order of 2,200 vehicles per day with daily flows along Rayford Street being in the order of 550 vehicles daily.</p> <p>While no surveys were completed on Winterlake Road or Daydawn Avenue it is considered that existing traffic flows along these roads would be slightly lower than those on Rayford Street (no vehicles associated with Warners Bay Private Hospital).</p>
2.3.2 Daily Traffic Flow Distribution	<p>Traffic flows would be reasonably balanced in both directions throughout the day.</p> <p>Observations on site indicate that there is a slight bias in northbound traffic along Fairfax Road associated with traffic travelling towards the Warners Bay Private Hospital. Similarly, there is a slight bias in traffic turning into Rayford Street associated with hospital staff who park along this road.</p> <p>The reverse movements would be expected during the evening peak.</p>
2.3.3 Vehicle Speeds	<p>No speed surveys were completed as part of the survey work, however observations on site indicate that drivers typically travel at or below the posted speed limit due to interactions with driveways, intersections and parked vehicles along the Fairfax Road and Rayford Street.</p>
2.3.4 Existing Site Flows	<p>The subject site currently contains an existing residential dwelling which generates minimal traffic demands.</p>
2.3.5 Heavy Vehicle Flows	<p>The local roads do not provide a through-way for heavy vehicles with heavy vehicle flows along these roads consisting of mostly local deliveries and Council waste collection vehicles.</p> <p>Throughout the traffic survey there were several heavy vehicles noted which were associated with residential construction occurring to the north as well as upgrades to expand the Warners Bay Private Hospital.</p>
2.3.6 Current Road Network Operation	<p>Observations on site indicate that the local roads operate very well throughout the day with no delays or congestion during the morning</p>


Item	Comment
2.4 Traffic Safety and Accident History	<p>A review of accident data provided by the RMS indicates that there were two accidents recorded along local roads in the locality of the site in the 5 years from July 2011 to June 2016. One of these accidents occurred at the intersection of Rayford Street and Fairfax Road involving a vehicle turning right onto Rayford Street with the second occurring at the intersection of Ruswell Avenue and Fairfax Road involving opposing turning movements. Neither accident involved speed or fatigue.</p> <p>Accident data published online by Transport for New South Wales also indicates that there has been a single accident at the western end of Daydawn Avenue, which involved a vehicle running off the road.</p> <p>Given the good road alignment and the low overall traffic flows along the local roads it is considered that the road network provides an acceptable level of overall traffic safety.</p>
2.5 Parking Supply and Demand	
2.5.1 On-street Parking Provision	<p>Kerbside parking is restricted towards the eastern end of Rayford Street with 'No Stopping' / 'No Parking' zones along the northern side of the road between Peachwood Close and Fairfax Road.</p> <p>No parking restrictions were noted at the western end of Rayford Street or along Daydawn Avenue.</p> <p>Kerbside parking is permitted to both sides of Winterlake Road and Daydawn Avenue.</p>
2.5.2 Off-street Parking Provision	No public off-street parking is available in the locality of the site.
2.5.3 Parking Demand and Utilisation	<p>Observations on site indicate that there is a high demand for parking along Fairfax Road and at the eastern end of Rayford Street associated with Warners Bay Private Hospital.</p> <p>Parking demands on Winterlake Road, Daydawn Avenue and at the western end of Rayford Street are very low.</p>
2.5.4 Set down or pick up areas	No set down or pick up areas in the locality of the site.
2.6 Public Transport	
2.6.1 Rail Station Locations	The nearest railway stations are Cardiff Station and Cockle Creek Station which are located around 6km to the north-east and north-west of the site respectively.
2.6.2 Bus Stops and Associated Facilities	The nearest bus stops are located on Thompson Road and Fairfax Road around 400-750 metres to the south of the subject site. Both bus stops provide a sign only with no seating or shelter.
2.6.3 Transport Services	<p>Local bus services are provided by Newcastle Buses with a single route operating through the locality along Medcalf Street, Fairfax Road and Thompson Road:</p> <ul style="list-style-type: none"> Route 363: Warners Bay to Newcastle via Speers Point, Glendale, Cardiff, John Hunter Hospital, New Lambton and Broadmeadow. <p>Buses along this route operate hourly throughout the day with half hourly services during the morning (5:30am to 7:30am).</p>

Item	Comment
	 <p>Figure 3 – Local bus services operating close to the subject site.</p> <p>Both Cardiff Station and Cockle Creek Station are located on the Newcastle and Central Coast Line which provides regular services between Newcastle, the Central Coast and Sydney.</p>
2.7 Pedestrians Network	<p>Pedestrian footpaths along Rayford Street are inconsistent with only a short section of footpath provided to the eastern side of the street, midway along its length.</p> <p>Footpaths are provided on most of the surrounding roads including along the eastern side of Fairfax Road. These footpaths connect with shared pathways including:</p> <ul style="list-style-type: none"> • Southern end of Fairfax Road • Lake Macquarie Foreshore, southern side of The Esplanade • Ruswell Avenue, extending north along Medcalf Street. <p>There are no footpaths along Daydawn Avenue.</p>
2.8 Other Proposed Developments	<p>There are residential developments proposed or currently being constructed towards the northern end of Fairfax Road including:</p> <ul style="list-style-type: none"> • 36 lot subdivision at 54-60 Fairfax Road (DA 1470/2013) • 29 lot subdivision at 52 Fairfax Road (DA 791/2016) <p>Warners Bay Private Hospital is also being expanded (DA 2122/2015) to allow for an additional 39 beds to the rear of the site. Construction for this expansion is currently underway.</p>
The Development	
3.1.1 Nature of Development	<p>The proposal is for the rezoning of land currently zoned E2 Environmental Conservation to R2 Low Density Residential. This rezoning will allow for a future subdivision of the site to provide up to 30 new residential lots with access from Winterlake Road and 10 lots with access from Daydawn Avenue.</p>
3.1.2 Access and Circulation Requirements	<p>Access to 30 lots created as part of the rezoning of the site will be provided via an extension of Winterlake Road at its western end with the remaining lots having access via an extension of Daydawn Avenue. These new sections of the road shall be designed and constructed in accordance with the Austroads Guides and the Lake Macquarie Development Control Plan (LMDCP).</p>
3.2 Access	

Item	Comment
3.2.1 Driveway Location	Individual driveways shall be located to satisfy the requirements of the Lake Macquarie Development Control Plan (LMDCP) and AS2890.
3.2.2 Sight Distances	<p>The Austroads Guide to Traffic Management 2013 specified two criteria which need to be achieved to ensure adequate visibility is provided at intersections. These are:</p> <ul style="list-style-type: none"> • Approach Sight Distance (ASD) which is the minimum distance available on the minor road approach to ensure that drivers are aware of the presence of an intersection; and • Safe Intersection Sight Distance (SISD) which is the minimum distance that should be provided on the major road to ensure that a driver can observe a potential conflict at the intersection and decelerate to stop before reaching the collision point. <p>The minimum values for these parameters are described in the Austroads Guide to Road Design 2009 and are determined based on the design speed of the road. For the posted speed limit of 50 km/hr along Fairfax Road and Winterlake Road, the Austroads Guide specifies the following sight distance requirements at the intersections of Fairfax Road with Winterlake Road:</p> <ul style="list-style-type: none"> • Approach Sight Distance – minimum 55 metres approaching Fairfax Road. • Safe Intersection Sight Distance – minimum 97 metres on each approach on Fairfax Road. <p>As part of the project work, Seca Solution has reviewed the sight distances at the intersection of Fairfax Road with Winterlake Road.</p> <p>Fairfax Road in this location provides a straight road alignment which allows for good visibility in both directions along Fairfax Road.</p> <p>Sight distances along Fairfax Road exceed 150 metres on the northern approach, with sight distance on the southern approach being greater than 130 metres. It is noted however that parked vehicles on Fairfax Road can impact upon the visibility for drivers turning out of Winterlake Road.</p> <p>The approach sight distance along Winterlake Road is more than 90 metres.</p> <p>Given the good road alignment the intersection of Fairfax Road / Winterlake Road provides sight distances consistent with the requirements of the Austroads Guide.</p> <p>Sight distances have also been reviewed at the intersection of Fairfax Road with Daydawn Avenue.</p> <p>Sight distances on Fairfax Road in this intersection exceed 300 metres on the northern approach. There is a crest to the south of this intersection on Fairfax Road which reduces the available visibility along the southern approach, however sight distances to the south of the intersection exceed the minimum requirement of the Austroads Guides. Sight distances at this intersection are therefore acceptable.</p>

Item	Comment
3.2.3 Service Vehicle Access	Waste collection for the site will be completed by Council kerbside waste collection along the local roads. This is consistent with the existing residential developments along this road. There may be an occasional demand for delivery vehicles to the individual lots, particularly during construction. These vehicles would be able to park on-street as required.
3.2.4 Queuing at entrance to site	No vehicles queues expected at the driveways for individual lots.
3.2.5 Comparison with existing site access	No formal access is currently provided off Winterlake Road or Daydawn Avenue. The proposed subdivision will see both of these roads extended to provide access for future dwellings.
3.2.6 Access to Public Transport	There are regular bus services that operate along Medcalf Street. No services operate along the northern end of Fairfax Road due to the low demand in this location. It is noted however that as new residences are constructed to the northern end of Fairfax Road, this may create additional demand on these existing services. There is adequate spare capacity within this service. The nearest bus stops are located around 400-750 metres to the south of the subject site along Fairfax Road / Thompson Road.
3.3 Circulation	
3.3.1 Pattern of circulation	Separate accesses will be provided for dwellings off Winterlake Road and Daydawn Avenue. Each road will be extended to provide access for future dwellings. There will be no internal connection between Winterlake Road and Daydawn Avenue.
3.3.2 Road width	Roads will be designed in accordance with the Austroads Guides and the LMDCP.
3.3.3 Internal Bus Movements	No requirement for buses to access the development.
3.3.4 Service Area Layout	No dedicated service area required for either site. Waste management will be completed by kerbside pickup to the front of each future dwelling.
3.4 Parking	
3.4.1 Proposed Supply	The supply of parking will be within each individual lot. All parking will be contained within the site with no impact on the surrounding road network.
3.4.2 Authority Parking	Lake Macquarie Development Control Plan provides the following parking requirements for single residential dwellings: <ul style="list-style-type: none"> 1 covered space and 1 space provided as single file parking.
3.4.3 Parking Layout	Driveways and garages will be provided for each future lot in accordance with Council DCP requirements.
3.4.4 Parking Demand	Parking will be provided for each future lot in accordance with the above rates.
3.4.5 Service Vehicle Parking	No dedicated service vehicle parking required on site. The occasional service vehicle will be able to park on-street as required to service the individual dwellings.
3.4.6 Pedestrian and Bicycle Facilities	None proposed. Consistent with the existing situation.
Traffic Assessment	
4.1 Traffic Generation	The RTA Guide to Traffic Generating Developments - Updated Traffic Surveys Technical Direction provides the following traffic generation rates for low density residential dwellings in regional areas: <ul style="list-style-type: none"> 0.71 weekday morning peak hour trips per dwelling 0.78 weekday evening peak hour trips per dwelling

Item	Comment
	<ul style="list-style-type: none"> 7.4 weekday daily vehicle trips per dwelling <p>Rezoning of the site would allow for a future subdivision providing up to 30 dwellings off Winterlake Road. These dwellings would generate 22 vehicle trips during the morning, 24 vehicle trips during the evening and 222 vehicles per day. These vehicles would all use Winterlake Road to access the site.</p> <p>A further 10 dwellings will be provided with access from Daydawn Avenue. These dwellings would generate 8 vehicle trips during the morning, 8 vehicle trips during the evening and 74 vehicles per day.</p> <p>It is considered that 80% of vehicle trips would be outbound during the morning peak and inbound during the evening.</p>
4.1.1 Daily and Seasonal Factors	Minimal daily and seasonal variation in traffic movements associated with the development, other than normal variation between weekdays (working days) and weekends.
4.1.2 Pedestrian Movements	<p>Given the location of the site being close to Biddabah Public School, demands for pedestrian movements between the school and residential housing would be anticipated.</p> <p>Pedestrians are able to walk along the existing footpaths along Winterlake Road or the grass verge on Daydawn Avenue to connect with the existing footpath on Fairfax Road.</p>
4.2 Traffic Distribution and Assignments	<p>The majority of vehicles travelling to the north or east would use Ruswell Avenue to connect with Medcalf Street and the regional road network. Recent development at the northern end of Fairfax Road however has provided a new road connection through to Derwent Crescent, which could appeal to traffic associated with the dwellings off Winterlake Road. Some vehicles could potentially use this route to connect with Medcalf Street via Lakelands Drive (further to the north). Inbound vehicles in the afternoon are able to turn right into Ruswell Avenue with minimal delays due to the opposing flows northbound on Medcalf Street having adequate gaps. The signalisation of Medcalf Street and The Esplanade has improved traffic flows in this area during the peak periods.</p> <p>Vehicles travelling to the south or west would use Fairfax Road to connect with The Esplanade before dispersing over a number of potential routes depending on their final destination.</p> <p>Vehicles would generally return along their respective routes in the reverse direction.</p>
4.2.1 Origin / destinations assignment	<p>For this assessment, it is considered that 80% of vehicles would have an origin / destination north towards Newcastle, Cardiff, Charlestown etc with the balance having an origin / destination to the south towards Lake Macquarie.</p> <p>Allowing for this the following split has been assumed:</p> <ul style="list-style-type: none"> 80% of vehicles have an origin/destination north of the site along Medcalf Street. <ul style="list-style-type: none"> All vehicles associated with dwellings on Daydream Avenue would use Ruswell Avenue to connect with Medcalf Street.

Item	Comment
	<ul style="list-style-type: none"> 50% of outbound vehicles associated with dwellings on Winterlake Road would use Ruswell Avenue to connect with Medcalf Street with 50% potentially taking the opportunity to access Medcalf Street at Lakelands Drive. All inbound vehicles would return via Ruswell Avenue. 20% of vehicles have an origin/destination south of the site along Fairfax Road. <p>80% of traffic would be outbound in the morning and 20% inbound with the reverse occurring in the afternoon.</p> 
4.3 Impact on Road Safety	<p>The intersection of Fairfax Road / Winterlake Road and the intersection of Fairfax Road / Daydawn Avenue both provide a good road alignment with good visibility on all approaches, consistent with the requirements of the Austroads Guides.</p> <p>There has only been two accidents recorded on the local roads surrounding the subject site in the 5 years between July 2011 and June 2016 indicating that the local road network provides an acceptable level of road safety.</p> <p>The proposed rezoning will not provide a significant increase in traffic demands along the local roads (see Section 4.4.1) and therefore will have a minimal impact upon overall road safety.</p>
4.4 Impact of Generated Traffic	
4.4.1 Impact of other development traffic	<p>Separate to this rezoning application there has been a development proposal to subdivide a four (4) lot subdivision off Rayford Street. This proposal sees an increase in traffic of 3 trips in the peak hour and 30 trips daily. This additional traffic has been included in the following assessment. Traffic associated with this subdivision will see 80% of traffic travel along Ruswell Avenue to connect with Medcalf Street with 20% travelling south along Fairfax Road to The Esplanade.</p>
4.4.2 Impact on Daily Traffic Flows	<p>Allowing for the traffic distribution and assignments above, development of the site would have the following impacts on local traffic flows:</p> <ul style="list-style-type: none"> Increase daily flows along Winterlake Road by 222 vehicles per day.

Item	Comment
	<ul style="list-style-type: none"> • Increase daily flows on Daydawn Avenue by 74 vehicles per day. • Increase daily flows along Fairfax Road (north of Winterlake Road) by 44 per vehicles per day • Increase daily flows along Fairfax Road (south of Rayford Street, north of Ruswell Avenue) by 208 vehicles per day to 2,208 vehicles. • Increase daily flows along Fairfax Road (south of Ruswell Avenue, north of Daydawn Avenue) by 110 vehicles per day. • Increase daily flows along Fairfax Road (south Daydawn Avenue) by 66 vehicles per day. • Increase daily flows along Rayford Street by 30 vehicles per day to 580 vehicles. • Increase daily flows along Ruswell Avenue by 217 vehicles per day. <p>While there are no specific limits on daily traffic flows, The RTA Guide to Traffic Generating Developments provides standards for assessing the capacity of a residential road. These standards are based upon environmental guidelines with outline the maximum hourly capacity of a residential road with respect to pedestrian safety and amenity.</p> <p>For a collector road, the desirable maximum is given as 300 vehicles per hour with an absolute maximum of 500 vehicles per hour.</p> <p>Peak hour flows along Fairfax Road (south of Rayford Street) are currently in the order of 223 vehicles per hour and the proposed development will increase these by up to 26 vehicles per hour during the evening peak. The existing flows along Fairfax Road, together with the additional flows associated with the development would be less than 300 vehicles per hour and are therefore less than the desirable capacity of this road. These additional vehicles would therefore have an acceptable impact upon the operation of Fairfax Road. Ruswell Avenue would function in a similar manner with flows less than those in Fairfax Road.</p> <p>As local streets, Rayford Street, Winterlake Road and Daydawn Avenue each have a desirable maximum of 200 vehicles per hour with an absolute maximum capacity of 300 vehicles per hour. The existing traffic flows along these roads together with the development traffic would be significantly less than the desirable capacity of 200 vehicles per hour. Allowing for this, the additional vehicles created by the proposed subdivision and rezoning would have a negligible impact.</p>
4.4.3 Peak Hour Impacts on Intersections	<p>Observations on site indicate that the intersection of Rayford Street and Fairfax Road currently operates well with no delays or congestion during the morning peak. As described in Section 4.4.1, both Fairfax Road and Rayford Street currently provide spare capacity to accommodate the increased traffic demands generated by the proposed rezoning and division.</p> <p>During the peak hours, the additional traffic demand created by the proposal would be less than 26 vehicles passing through the intersection of Fairfax Road and Rayford Street in the evening peak, of which most</p>

Item	Comment
	<p>would be through movements along Fairfax Road. These movements equate to one additional vehicle passing through this intersection every two minutes on average, and would therefore not have a noticeable impact upon its operation.</p> <p>Allowing for the traffic distribution and assignments described in Section 4.2, most of these additional vehicles are expected to travel along Ruswell Avenue to connect with Medcalf Street with 80% travelling outbound during the morning (left onto Medcalf Street) and inbound during the evening (right into Ruswell Avenue).</p> <p>During the morning peak, downstream traffic signals at the intersection of Fairfax Road and The Esplanade create breaks in the traffic which allow for vehicles to turn left onto Medcalf Street. Similarly, during the evening peak the reduced northbound flows along Medcalf Street provide opportunities for vehicles to turn right into Ruswell Avenue. It is therefore considered that these additional vehicles would not have a significant impact upon the operation of this intersection.</p> <p>Traffic associated with the rezoning that may choose to travel north and connect with Medcalf Street from Lakelands Drive will be in the order of 7 trips in the AM peak with much lower demand in the PM. These additional trips will be minimal and well within the capacity of the local roads. The roundabout intersection of Medcalf Street and Lakelands Drive is observed to operate well with a left turn slip onto Medcalf Street providing additional capacity. These additional trips will have a negligible impact on the operation of this intersection.</p> <p>The impact upon the surrounding intersections would be significantly lower as traffic disperses along several potential routes.</p>
4.4.3 Impact of Construction Traffic	<p>Given its nature and large area, all works can be accommodated within the site with no impact upon the external road network. Parking demands associated with construction vehicles and workers can be contained within the site.</p> <p>During construction, there will be a requirement for construction vehicles to access the site as well as additional traffic movements associated with worker. These movements can be catered for within the local road network.</p>
4.4.4 Other Developments	<p>Nearby developments are proposed along Fairfax Road (as described in Section 2.8) which could increase the local traffic demands along Fairfax Road. These would have been subject to individual traffic assessments as part of their own DAs.</p> <p>Fairfax Road currently operates well within its capacity and these additional developments would not significantly increase the traffic flows in this location (less than 100 additional vehicles during the peak hour). Allowing for these vehicles together with the development traffic associated with this proposal, the peak hour flows along Fairfax Road would be significantly less than the environmental limit of 500 vehicles per hour.</p> <p>It is also noted that new residential development at the northern end of Fairfax Road would be likely to use the new road connection to Derwent Crescent to connect with Medcalf Street via Lakelands Drive.</p> <p>It is considered that there is adequate capacity to accommodate these developments as well as the rezoning proposed.</p>

Item	Comment
4.5 Public Transport	
4.5.1 Options for improving services	None required. There is spare capacity within the bus services provided. This development will not significantly increase the demand for these services, consistent with the existing situation.
4.5.2 Pedestrian Access to Bus Stops	Consistent with the existing situation. The nearest bus stops are located some 400-750 metres to the south of the site along Fairfax Road.
4.6 Recommended Works	
4.6.1 Improvements to Access and Circulation	Ensure access and internal roads / driveways are designed and constructed in accordance with Council requirements.
4.6.2 Improvements to External Road Network	None required.
4.6.3 Improvements to Pedestrian Facilities	Pedestrian footpaths shall be provided along the internal roads in accordance with the Lake Macquarie Development Control Plan.
4.6.4 Effect of Recommended Works on Adjacent Developments	No works proposed that will impact on adjacent developments.
4.6.5 Effect of Recommended Works on Public Transport Services	None.
4.6.6 Provision of LATM Measures	None Required
4.6.7 Funding	All works shall be funded by the developer.

Site Photos:

Photo 1 – Visibility looking right (south) along Fairfax Road from the intersection of Fairfax Road / Rayford Street.



Photo 2 – Visibility looking left (north) along Fairfax Road from the intersection of Fairfax Road / Rayford Street.



Photo 3 – Closed end of Winterlake Road showing the subject site.



Photo 4 – Visibility looking right (south) along Fairfax Road from the intersection of Fairfax Road / Winterlake Road.



Photo 5 – Visibility looking left (north) along Fairfax Road from the intersection of Fairfax Road / Winterlake Road.



Photo 6 – Visibility looking right (south) along Fairfax Road from the intersection of Fairfax Road / Daydawn Avenue.



Photo 7 – Visibility looking left (north) along Fairfax Road from the intersection of Fairfax Road / Daydawn Avenue

Conclusion:

From the site work undertaken and the review of the development proposal and associated plans against the requirements of the RMS Guide to Traffic Generating Developments and Austroads Guide to Traffic Management, it is considered that the proposed rezoning application should have no objections raised on traffic and access grounds. The additional traffic movements generated by the development will have an acceptable impact on the surrounding road network.

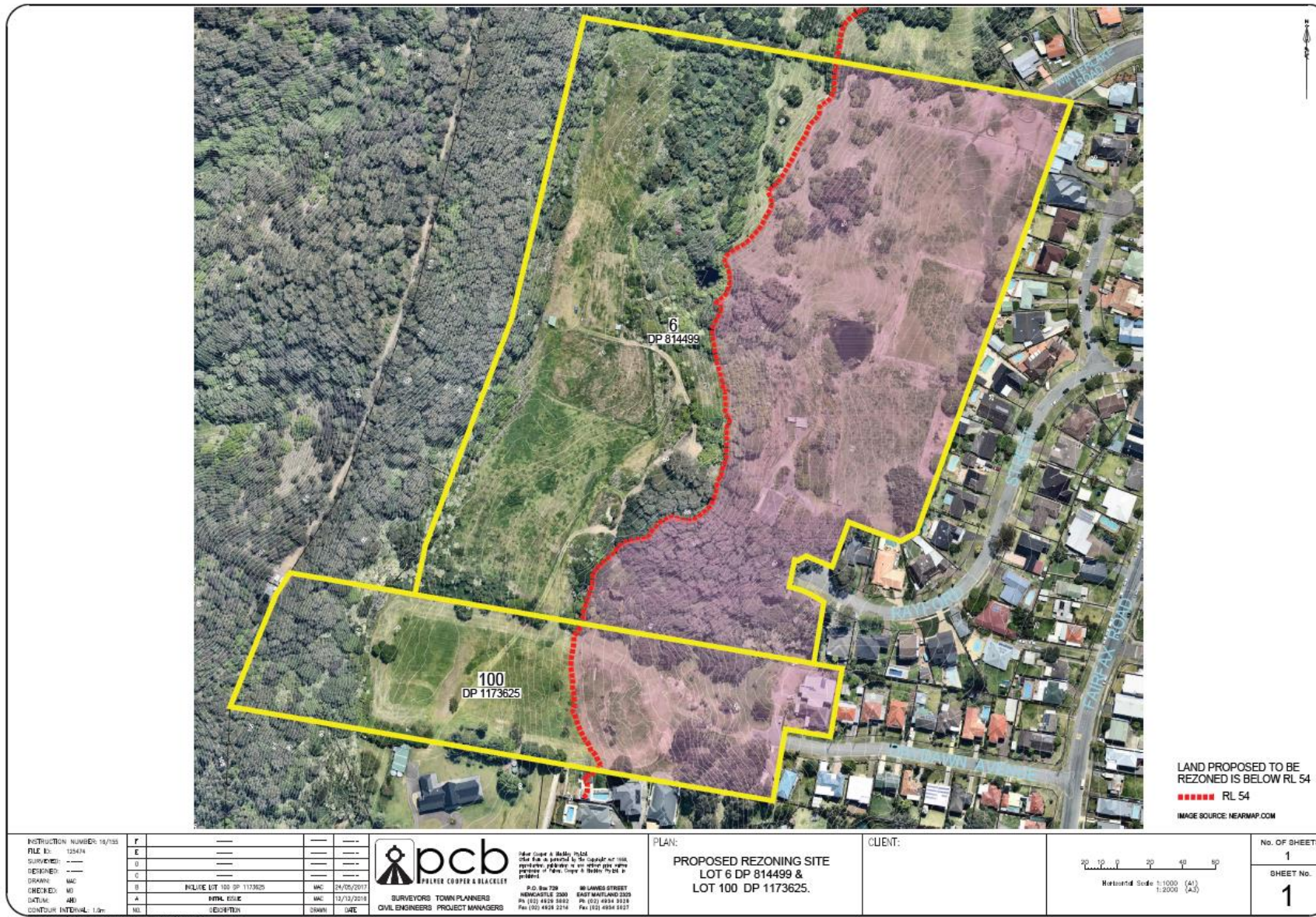
Sight distances at the intersection of Fairfax Road / Winterlake Road and at the intersection of Fairfax Road / Daydawn Avenue are consistent with the requirements of the Austroads Guides.

Please feel free to contact me on 4032 7979, should you have any queries.

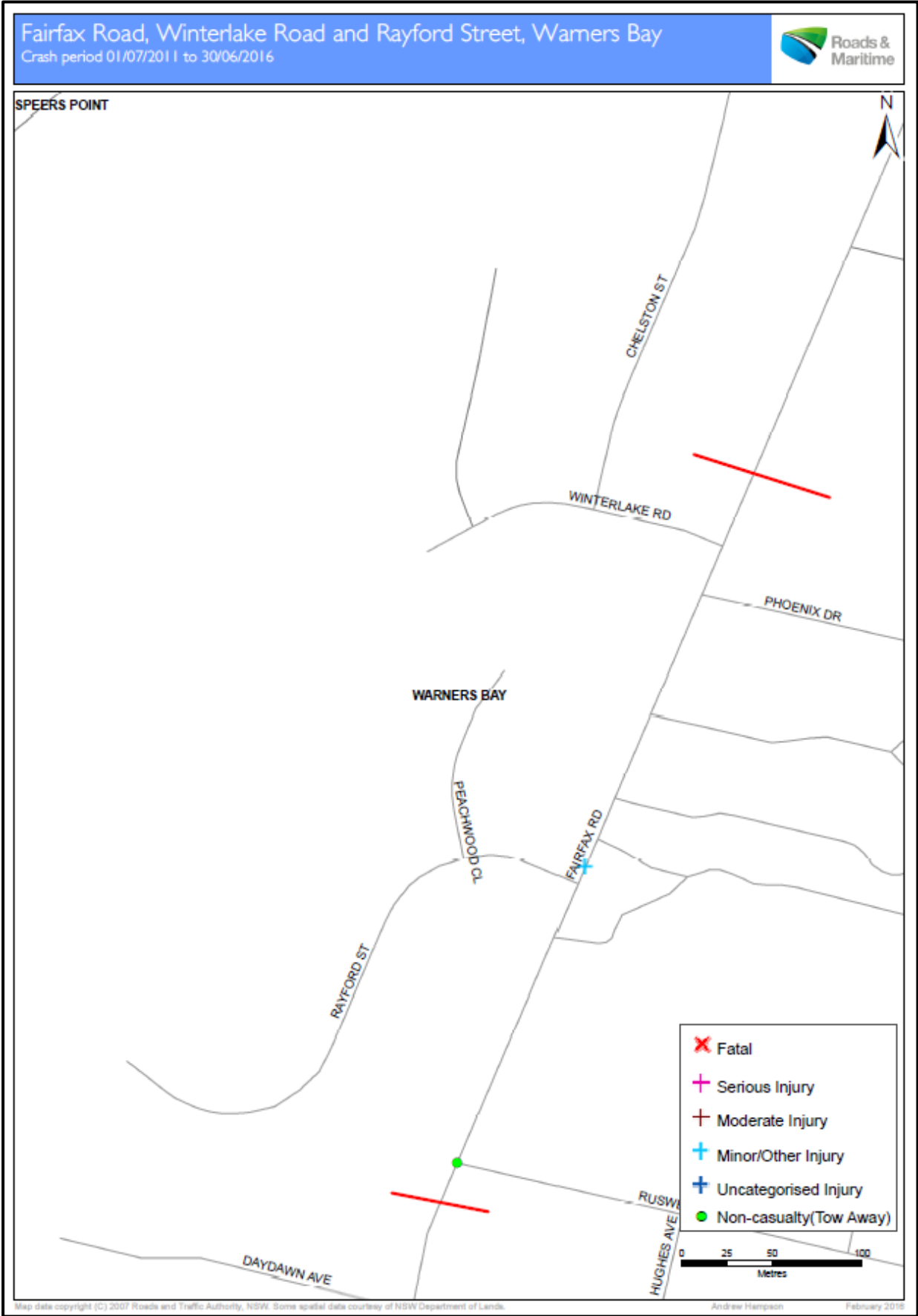
Yours sincerely,

Sean Morgan
Director

Attachment A: Site Plan



Attachment B: Accident Data



# Crash Type			Contributing Factors			Crash Movement			CRASHES			CASUALTIES			
Car Crash	2	100.0%	Speeding	0	0.0%	Intersection, adjacent approaches	1	50.0%	Fatal	0	0.0%	Killed	0	0.0%	
Light Truck Crash	1	50.0%	Fatigue	0	0.0%	Head-on (not overtaking)	0	0.0%	Serious inj.	0	0.0%	Seriously inj.	0	0.0%	
Rigid Truck Crash	0	0.0%				Opposing vehicles; turning	1	50.0%	Moderate inj.	0	0.0%	Moderately inj.	0	0.0%	
Articulated Truck Crash	0	0.0%				U-turn	0	0.0%	Minor/Other inj.	1	50.0%	Minor/Other inj.	1	100.0%	
*Heavy Truck Crash	(0)	(0.0%)				Rear-end	0	0.0%	Uncategorised inj.	0	0.0%	Uncategorised inj.	0	0.0%	
Bus Crash	0	0.0%				Lane change	0	0.0%	Non-casualty	1	50.0%	^ Unrestrained	0	0.0%	
*Heavy Vehicle Crash	(0)	(0.0%)				Parallel lanes; turning	0	0.0%				^ Belt fitted but not worn, No restraint fitted to position OR No helmet worn			
Emergency Vehicle Crash	0	0.0%				Vehicle leaving driveway	0	0.0%	Self Reported Crash	0	0%	Crashes Casualties			
Motorcycle Crash	0	0.0%				Overtaking; same direction	0	0.0%				1	2013	1	
Pedal Cycle Crash	0	0.0%				Hit parked vehicle	0	0.0%				1	2012	0	
Pedestrian Crash	0	0.0%				Hit railway train	0	0.0%							
* Rigid or Artic. Truck * Heavy Truck or Heavy Bus															
# These categories are NOT mutually exclusive															
Location Type			Weather			Road Surface Condition			Time Group			Casualties			
*Intersection	2	100.0%	Fine	2	100.0%	Wet	0	0.0%	00:01 - 02:59	0	0.0%	12.5%			
Non intersection	0	0.0%	Rain	0	0.0%	Dry	2	100.0%	03:00 - 04:59	0	0.0%	8.3%			
* Up to 10 metres from an intersection			Overcast	0	0.0%	Snow or ice	0	0.0%	05:00 - 05:59	0	0.0%	4.2%			
Collision Type			Fog or mist	0	0.0%	Natural Lighting			06:00 - 06:59	0	0.0%	4.2%			
Single Vehicle	0	0.0%	Other	0	0.0%	Dawn	0	0.0%	07:00 - 07:59	0	0.0%	4.2%			
Multi Vehicle	2	100.0%				Daylight	2	100.0%	08:00 - 08:59	1	50.0%	4.2%			
Road Classification						Dusk	0	0.0%	09:00 - 09:59	0	0.0%	4.2%			
Freeway/Motorway	0	0.0%				Darkness	0	0.0%	10:00 - 10:59	0	0.0%	4.2%			
State Highway	0	0.0%				Speed Limit			11:00 - 11:59	0	0.0%	4.2%			
Other Classified Road	0	0.0%				40 km/h or less	0	0.0%	12:00 - 12:59	0	0.0%	4.2%			
Unclassified Road	2	100.0%				50 km/h zone	2	100.0%	13:00 - 13:59	0	0.0%	4.2%			
						60 km/h zone	0	0.0%	14:00 - 14:59	0	0.0%	4.2%			
						70 km/h zone	0	0.0%	15:00 - 15:59	1	50.0%	4.2%			
									16:00 - 16:59	0	0.0%	4.2%			
									17:00 - 17:59	0	0.0%	4.2%			
									18:00 - 18:59	0	0.0%	4.2%			
									19:00 - 19:59	0	0.0%	4.2%			
									20:00 - 21:59	0	0.0%	8.3%			
									22:00 - 24:00	0	0.0%	8.3%			
												McLean Periods % Week			
												A	1	50.0%	17.9%
												B	0	0.0%	7.1%
												C	0	0.0%	17.9%
												D	0	0.0%	3.5%
												E	0	0.0%	3.6%
												F	0	0.0%	10.7%
</															

Note: Crash self reporting, including self reported injuries began Oct 2014. Trends from 2014 are expected to vary from previous yrs. More unknowns are expected in self reported data. Reporting yrs 1996-2004 and 2016 onwards contain uncategorised inj crashes. Percentages are percentages of all crashes. Unknown values for each category are not shown on this report.

Attachment C: Traffic Data

