

Catherine fields Community Road Safety Audit/ Review

Report

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SCOPE

This review is in relation to the proposed planning for a school to be located at the midpoint along Catherine fields road.

The paper is part of a submission to the Council to raise community concerns over the proposal.

The **review** focuses on items such as: current conditions; speed; visibility splays and distances; safety and needs of pedestrians, cycle and vulnerable road users; topography; affect upon altered traffic behaviour, road conditions, and other road safety critical issues.

The inputs for this report are dependent on information available so please refer to assumptions made further in the report. The review has looked not just at the immediate location but all major corridor access and egress for the proposed site, to inform the review.

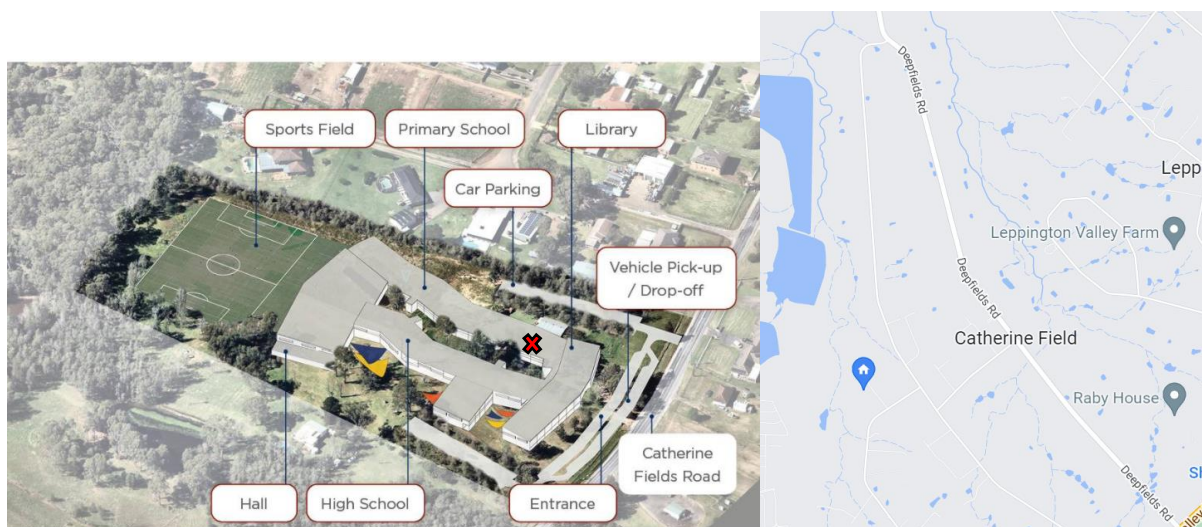
LIMITATIONS

For the purpose for preparing this report, the following key data has not been accessible for the community to make informed decision and responses:

- Any transport or council design advice
- Road safety traffic counts conducted in Jan/ Feb 2022
- Any Road network condition assessments
- Official road and school designs
- Any independent safety reports
- Maintenance and repair schedules

PURPOSE

The purpose for this report is to collate all road safety / traffic issues that are likely to impact the community with the proposed development of a school along a major corridor in the Catherine fields community. This school is proposed for Catherine fields road, and the scope of the report includes reflecting on safety issues along the three major enroots to the location. This is Deepfields road, Catherine fields Road and Springfield Road.



EXECUTIVE SUMMARY

The summary findings of this report indicate genuine concerns regarding road safety in and around the Catherine fields precinct. The primary concerns are in three key areas:

- **Road Conditions**
- **Pedestrian safety**
- **Traffic concerns**

ROAD CONDITIONS

In terms of road safety conditions, the current street scape in all major access corridors is reflective of the semi-rural nature of the precinct. These roads are referred to as Urban local, Sub Arterial roads and Urban arterial roads for the purpose of aligning to road functional classifications. The Catherine Fields Road access points, and the two key arterials being Springfield Road and Deep fields road are all local roads and sub-arterial, with speeds of between 60km/p/hour and 80km per hour. It is assumed recent traffic count data will inform the classifications requirements or changes to this due to the recent adjacent Catherine Park precinct which has introduced 18.5 hectares¹ of residential medium density housing. This has negatively impacted road safety conditions and has increase traffic volumes in key arterial corridors.

It is also relevant to note that due to the rural nature of these roads and residence, there are a large volume of trucks observed in the area. This is supported by ABS ² statistics that support a growth of light rigid trucks in NSW by 6% in 21/22. This is pertinent to the road conditions, expectations for future road design discussed in this report, and relevant to pedestrian concerns through the report.

In a summary of key concerns regarding road safety conditions the following key items are raised in this report and reflect community concerns:

1. There are poor road conditions on all corridors, including potholes and very poorly constructed temporary hot and cold mix patches across a large percentage of the corridor
2. There is poor line marking / delineation in large parts of the road corridor
3. There is poor condition/ no constructed shoulders to support road safety outcomes
4. There is likely no lean mix sub-base to support increased transport / traffic flows. Notably there is concerns about the concrete comprehensive strengths, geometry and thickness IAW the RMS NR82 lean mix concrete subbase specifications that are available on the internet
5. Lack of culverts and water management
6. Crest vertical curve in the immediate proximity of the school location restricting site distances

These concerns are itemised and explored in the risk items further in this report.

¹ DPIE AECOM Catherine fields Precinct transport and access review report and addendum

² ABS.GOV.AU 20/21 VEHICLE REGISTRATION TYPES

PEDESTRIAN SAFETY

In terms of Pedestrian safety, it should be noted that it is important to provide high quality walking and cycling routes to schools³ along proposed public transport routes. All three corridors are public transport access routes.

All three corridors are currently unsafe for pedestrians in the current environment. The following key issues have been highlighted:

1. No pedestrian paths
2. No pedestrian crossings
3. No bike paths or safe cycle ways
4. No/limited bus infrastructure
5. No level or even access, no kerbs, no drainage, or water retention,
6. Limited street lighting
7. Poor water catchment

Full insights into these risks are expressed further in the report. The main challenges relate to the lack of any suitable and safe pathways and cycles ways. This is exacerbated by the general poor nature of the roads as conveyed above, which present an unsafe interface environment for motorists and pedestrians, especially school aged children. Cycling and walking have significant roles in our transport systems and the Austroads guides state that 'all roads should have some type of walking facility out of the vehicle path'⁴

The sides of the roads are uneven, gravel environments with encroachment into the live traffic lanes due to disrepair and poor design. Furthermore, the ground is uneven, and in wet weather events, walking on some parts of the corridor is not possible. It is also relevant to call out the Anthony Road weir and its history impacting road closures and a fatality in recent years.

There is also the problem with lack of street lighting which creates a further unsafe environment in and around any school precinct. The lack of street lighting, road dis-repair and lack of amenity to provide safe access and egress creates an unsafe environment. A quantified risk assessment could help frame the level of risk, however all the relevant inputs to deliver this are not available to consider.

It should be noted also that a large part of the traffic is heavy vehicle fleet, this creates further key challenges relating to potential consequence of any road accidents in the area.

As there are no approved design plans to comment, under the current road configurations, with single dual carriage way traffic, this presents road safety risks for buses (where drivers will be required to stop in a live lane of traffic to alight passengers) and for those motorists turning right or left into any school facility. This is likely to impact rear end crashes as well as causing significant delays to thoroughfare traffic.

Without large significant amenity upgrade on all three access corridors, there will be a quantifiable risk. Furthermore, through any increase in vehicle access in the corridor associated with the school environment, there will be an additional level of risk involved.

³ DPIE AECOM Catherine fields Precinct transport and access review report and addendum, 2.3.4

⁴ 2009 Austroads Guide to road design 6A: Pedestrian and cyclist paths

Please note these comments are reflective of concerns associated with design even if current suggested plans incorporate drop off points within the school site. The safety and traffic considerations are all relevant in this setting.

TRAFFIC CONCERNS

In relation to traffic related issues, there are a range of concerns relative to the current road design, the semi-rural residential settings in the area and the likely impacts that a further increase to traffic in the area will mean for residents. The following key points reflect the major issues highlighted by this review:

1. Speed zone changes from 80:60:80 km/p/h
2. Degradation of roads since recent increase to residential communities in vicinity
3. End of queue incidents
4. Inter-section capacity
5. Impacts to thoroughfare traffic

These are explored in detail below, however the key identified risks are in relation to end of queue incidents relative to the current proposed site location. There is a short distance curve that will impact south-east travelling motorists and increase the risk of incidents in this location. This is compounded by the behaviours and current signposted limited of 80km/p/h which would require significant road design features to be in place to create a safe environment.

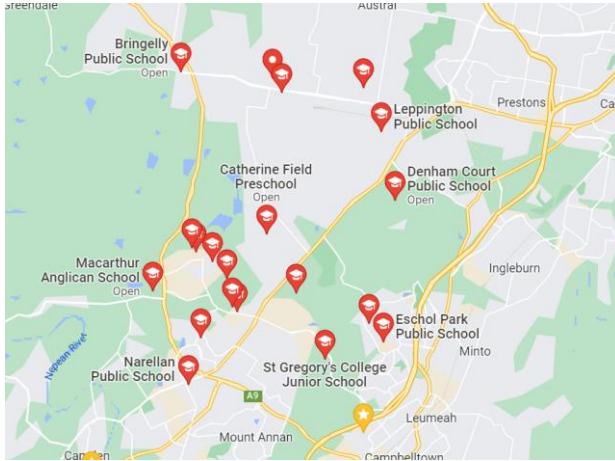
There is also poor line of sight at the major corridor interchange between Catherine fields road and Deepfields road. Any further capacity at this intersection without a full dual carriageway upgrade would see a significant risk for turning motorists. This is for those turning right into Catherine fields road with a small turn lane and therefore a queueing issue for thoroughfare motorists (and end of queue incident risk) but will also be difficult for motorist turning left or right from Catherine fields road into Deepfields road. The lack of line of sight to the right when turning left, and the obstruction of traffic from the left to enable turning right, are both going to impact safe outcomes.

The issues of impacts to local traffic are also a legitimate concern. As there are limited viable active transport solutions, even with a staged build-up of students, this would present peak morning and afternoon traffic issues in the area, noting this is compounded by adjacent residential settings already having a significant impact to corridor usage. This is also informed by the fact all inroads are single lane dual direction carriageways. Furthermore, this is informed by the current road conditions explained above.

FURTHER ISSUES

- It should also be noted that there are already 8 schools in a 6km radius of the current location.
- Schools would better be served by the amenity in growth defines precincts, the current location is not posted on the DPEI website for redevelopment under the current Catherine Park or Catherine fields.
- Amenity for schools could easily be facilitated by the projected growth in the Leppington North/ Austral precincts and these plans/ areas and reflective of the residential settings scoped rather than impacting semi-rural properties.
- Although the Wollondilly areas is a growth precinct, the ABS indicates that the annual growth rate for school enrolment is at its lowest level since 2008.

- A further risk consideration to be tabled in the residential land used in the adjacent Catherine Park precinct which has introduced 18.5 hectares⁵ of residential medium density housing. This has negatively impacted road safety conditions and has increase traffic volumes in key arterial corridors



INPUTS TO REPORT

The following inputs are relevant for the outcomes of this report

- Road safety statistics- centre for road safety
- In-situ inspections
- Catherine fields, Catherine Park and Leppington precinct reports from the Department of Planning
- ABS data sets
- Advertiser new articles
- Accessible technical specifications relevant to road design

REALISED RISKS

For relevance to this report, there has been a recent fatality, within a 500m radius of the proposed location. This occurred on Sunday 13th February on a 40-degree curved aspect of Springfield fields road. There were previous fatalities along the corridor in 2009, along with several crashed between 2009- 2021 that resulted in injuries (2 car accident in 2014 at Catherine fields road junction, July 17, 2017 at Deepfields road, Bus and car crash July 18, 2019)

Furthermore, the following graphs titled 'casualties' and 'crashes' is the Local Government Area (LGA) are from the Centre for Road Safety. This represents Camden crash data which can be used to derive insights from the LGA about crash data. Notably the broader insights on the website frames local roads that have a higher risk factor in road crashes.

For the LGA in the years 2016-2020 there were 735 casualties of which 182 were serious injuries.

⁵ DPIE AECOM Catherine fields Precinct transport and access review report and addendum

In terms of assessing risks, this information is an important piece of data that can validate community concerns and be used to help frame absolute value scores used in any quantified risk assessment process. This would be dependant of further access to the design and other key data inputs from council.



ASSUMPTIONS

The following assumptions have been made for the purpose of putting this report together

- That the proposed school campus will house 1500 students
- That increased vehicular traffic is expected due to the fact this is a semi-rural area and there are nil immediate residential settings for which this school would directly accommodate with active transport solutions
- That akin to other local school environment, pick up and drop off times will impact traffic flows
- That proper road safety assessments and designs will be available to the public for comment to shape and frame a more detailed response

DESCRIPTION OF PROJECT

The proposal is for a new Independent K-12 school off Catherine Fields Road to school 1580 students. The below is an Artist impression which was supplied in a Macarthur Advertiser article on Nov, 1, 2021.



SITE INSPECTIONS

Site inspections were carried out in Jan 2022> Feb 28th, 2022. These were delivered as both in vehicle drive throughs and in walking each corridor.


RISK MATRIX


The following risk matrix has been applied to the risk tables below. The risk outcomes in the following segment are based on worst case scenario determination. Refer to insights from recent crash history to frame and inform that LGA risks insights that have framed thresholds:

Severity	Minor or property damage A person who suffers no injury or requires minor treatment	Moderate A person who attends a hospital on the same day or subsequently admitted to hospital with non-life-threatening injuries	Serious A person who is admitted to hospital with life threatening or life altering injuries	Fatal A person who dies within 30 days from injuries received in a road traffic crash
Probability				
Weekly Is expected to occur	Medium	High	Extreme	Extreme
Monthly Will probably occur	Medium	Medium	High	Extreme
Half yearly May occur	Low	Medium	High	Extreme
Yearly Might occur but doubtful	Very Low	Low	Medium	High
Every 5 years or less Might occur but only under exceptional circumstances	Very Low	Very Low	Medium	High

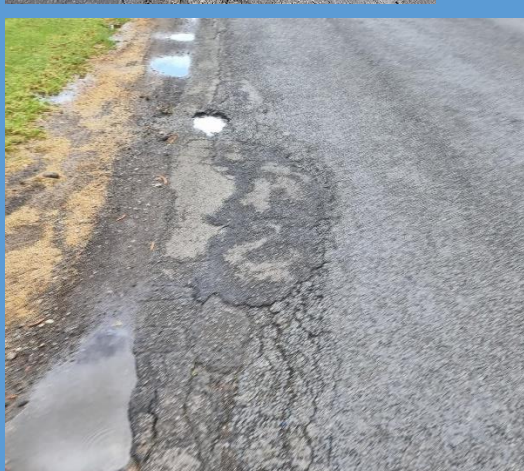
RISKS

The following is all the recorded audit/ review outcomes relevant to the report, and summarised in the Executive summary

Risk: Speed Zone changes		
	<p>Vehicles travelling north-west/ south-east may continue to travel at speeds more than 60km/h on approach to and through the proposed location given the close proximity to the speed zone change. This increases the likelihood of crashes occurring. Vehicles were observed to be exceeding the 60km/h speed limit through this location during the site inspection</p> <p>The picture shows the street sign, travelling southeast. The sign is atypical of the street scape with no lighting. The typical speeds in this area were observed to be greater than the signposted 60kmph</p>	Risk
		High

Risk: no constructed shoulders to support road safety outcomes		
	<p>There are no constructed shoulders on the roads. This means there is no clear delineations. This is exacerbated by no line marking, and no street lighting. This impacts the overall safety through the corridor. Notably this impacts any pedestrians and cyclists, where there are no safe access paths along the corridors. There are also no safe bus stops to support safe transportation of students via bus operations. If there is not a significant corridor upgrade, any increase to pedestrians along the corridor and the increase in vehicular movements will create a higher risk environment</p>	Risk:
		High

Risk: Road conditions



There are poor road conditions on all corridors, including potholes and very poorly constructed temporary hot and cold mix patches across a large percentage of the corridor. These features create hazards for motorists and increase the risk of traffic incidents, vehicle wear and tear and present significant challenges relating to interface risks with pedestrians and motorists.

Photo 1- 10cm depression, divet in road surface. Indicative of type of condition over 60% of the road/ corridor

Photo 2- Example of potholes and poor line delineation of the road surface. The pothole is 15cm by 8 cm, and 3 cm deep. This is indicative of potholes across the corridor

Photo 3- Example of patchwork hot/cold mix applied to surface. This creates a 24-hour fix, but otherwise presents a hazard and the mix mis forms due to heavy wear and tear. This picture is also indicative of road flooding in weather events.

Photo 4- Example of potholes, wear and tear and poor line marking and edge protections for motorists

Risk:
High

Risk: There is poor line marking / delineation

There is poor line marking in segments of all major access/ egress corridors. Without clear line marking and aggregated by no clear edge protections / delineations, this creates an environment of uncertainty for motorists who may be uncertain of correct lines of travel and encroachment into areas that are the only current pedestrian and cyclist access paths.

The risk exposure is for increased risk of pedestrian/ cyclist strikes, increased risk of errant vehicles, and increased risk of accidents due to poor edge protections (where there are notable wear and tear issues that could deviate the line of travel significantly)

Risk:
High

Risk: lean mix sub-base concrete comprehensive strengths, geometry



There have been no major road upgrades or full-scale resurfacing works on this corridor in the last 15 years excepting the 1km from the Camden Valley way to the temporary roundabout along Springfield Road. The normal pavement life is 10 years when constructed effectively. Based on inspections of the site, and the patchwork of repairs, the structural integrity of the pavement is not ideal. The practice of use of cold and hot mix patch repairs has delivered no outcomes, and the warping of this surface in most cases presents significant hazards for motorists in this environment. A higher volume of traffic will enhance this risk

Risk:
High

Risk: Lack of culverts structures



There are currently no culverts under or adjacent to the current road structures along the corridor like embankments or natural subterranean channels. There is also no sewerage pipes and other infrastructure. As the properties in the area are semi-rural as are the roads, any further large-scale developments will require significant considerations to upgrade the corridor structures. The impacts to road safety are direct impact to road flooding. Road flooding occurs regularly with any rains due to lack of infrastructure. This impacts the risk rating of the road and impacts safe thoroughfare. With current volumes it is somewhat managed but any increased volumes in the area will continue to increase risk exposure.

The pictures embedded reflect significant flooding in the corridor after rains and also are pictorial representations of the problem with cold mix solutions being applied instead of effective pavement repairs

Risk:
High

Risk: Crest vertical curve in the immediate proximity of the school location restricting site distances



Immediately adjacent to the proposed school location is a crest curve that is a danger when considering any changes traffic conditions in this area. The line of sight is restricted from the bottom of the crest to under 200mtr. Any banked traffic or slowed movements in this area will create an end of queue accident risk. This is further informed by nil pedestrian and cycle paths which would enhance the risk to this group if there were no significant upgrades to separate traffic movements. This is impacted further by the lack of edge protection, poor line marking and poor conditions of the roadway along the corridor.

Risk:
High

Risk: No pedestrian paths or bike paths

There are no pedestrian footpaths along any of the major corridors. In order to meet Austroads guidance, the need for footpaths in a school community setting would mean the need to fully upgrade all ingress routes as part of a functional network requirement. Land transport NZ, frame the requirement in settings where there are less than 3 dwellings per hectare, that shoulders should be part of the landscape and footpaths on at least one side. This advice is adopted in the Austroads guidance

The lack of footpaths means that currently there is a high risk of interface with Members of the public and motorists which could result in a fatality

Risk:
High

Risk: No pedestrian crossings

There are currently no safe pedestrian crossing on any of the corridors to facilitate safe egress across roadways for members of the public or any school community. The nature of the community in its current setting does not require significant consideration of pedestrian crossing however under any new conditions that increase public transport and public thoroughfare in the area this would be required.

Risk:
Moderate


Risk: No bus infrastructure

	<p>There is only two sheltered bus stations on the route and all other bus stops are along the road corridor. The current bus stops do not allow for a safe alignment as the stops are in live traffic lanes. This presents a risk for rear end incidents as well as interface between pedestrians and motorists that could result in a fatality The current risks would be increased through any further pedestrian movements along the corridor.</p>	
		Risk: Moderate to High

Risk: Limited/ No Street lighting

	<p>There is currently no street lighting along the corridor. Reflective of operating hours and the intent for out of hours childcare, there is a significant increased risk for pedestrians and vehicular movements along the corridor. Street lighting helps reduce night-time/ low light condition visibility and can reduce pedestrian crashes significantly.</p>	

Risk: Inter-section safety- Poor line of site Catherine fields road/ Deep fields road

	<p>The inter-sections in the area will be expected to have increased traffic movements. In particular there is a risk at the current major Catherine fields and Deep fields road inter-section for major changes to traffic movements. There is already a significant risk due to lack of visibility and high-speed road movements. Any further traffic bank ups will case significant end of queuing incidents at the point of turning. This is the case for traffic turning right into Catherine fields road from Deepfields road, but also queuing at Catherine fields in the lead up to the intersection which in less than 100 metres from a 65% bend.</p> <p>The picture here represents a driver view on the exit of Catherine fields road. There is limited line of sight in the right-hand direction</p>	
		Risk: High

ADDITIONAL SAFETY AND ENVIRONMENT RISKS

It should be noted that as a part of inspection of the community and corridors, that there is no Sewerage treatment in this land block or surrounding blocks. This is a potential environmental issue that would have significant safety impacts, in the case this is not managed effectively. It should be further noted that recent flooding events over the last 3 years in the area, shape that inundation hazard for any on site bio-septic solutions. As there is a creek within the vicinity of this location and considering the large capacity requirements in a school setting, there is a legitimate risk of contamination that should be considered.

RISK SUMMARY

All risks that have been annotated denote a moderate to high-risk rating. This is due to the potential consequence of outcomes, and due to the compounding nature of many of these risks interfacing with each other to create a high-risk environment.

Any new facilities would need to be considered as part of a significant infrastructure upgrade in the local area to facilitate safety and amenity for the expected increase volumes.

Should the area not be upgraded, there is a high risk to impacts for the community in relation to the conditions of roads and traffic impacts which impact the current level of safety.

The key critical traffic issues that frame a priority are as follows:

- 1- End of queue traffic incident increased risk at the inter-section of Catherine fields road and Deepfields road
- 2- End of queue traffic incidents at the proposed location with a short but distinct gradient change which impacts line of site for motorists along Catherine fields road
- 3- Alteration to speed zones and the significant behavioural changes that would be needed to manage the risk environment if a school setting was introduced
- 4- The poor conditions of roads and infrastructure create a cacophony of risks for active transport users and notably students, which increased the risk of vehicular and pedestrian interactions and therefore incidents. This should be considered with the network of road features, and the residential settings of this environment which shape a large number of challenges to overcome to ensure a safe operating environment.
- 5- Traffic impacts should be considered as the thoroughfare through this corridor is for many a short cut from the major Bringelly Road and Camden Valley Way routes. A large increased volume of traffic may be redirected to these roads during peak times which will have a compounding effect to current traffic challenges. Juxtaposed to this, people journey through this area for local residents may be significantly and detrimentally impacted due to the current lane configurations.

CONCLUSIONS

The road safety conditions in the area do not appear congruent to planning for further thoroughfare of traffic in the community. Any changes that increase volumes of traffic or pedestrian/active transport needs should be considered only if there are significant corridor upgrades. This would be inclusive of dual carriageways, effective bike paths or pedestrian walkways, street lighting, the development of road infrastructure (kerbs, culverts, effective pavement structures). Without due consideration of the entire corridors being upgraded, the impacts and risks to traffic and pedestrians is moderate to high. Liabilities associated with this would likely be impacted due to the road conditions in the immediate area and lack of effective treatments in place.