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5-C2305.00

Dear Sarah

Curtis Street Additional Information

As per my email this letter provides additional information on the bullet points provided and listed below:

- Kindercare childcare centre impact
- Cumulative impact of Kindercare childcare centre and potential development of the Business Area
- Potential effects on Creswick Terrace and Randwick Rd (identified but not assessed)
- Impact on Northland roads, Paisley Terrace, Farm Rd, Seaforth Terrace, Rosehaugh Ave, Karori Rd and side streets (is this necessary?)
- No consideration of potential rat runs on minor streets
- Inadequate parking and on site provisions (specify entry/exit points, parking) (is this necessary?)
- Suitability of large trucks on narrow roads

I believe that the bullets can be summarised into four key areas as presented below:

a. Kindercare Impact
b. Rat-running / effects on local roads
c. Parking and site access provision
d. Suitability of trucks on narrow roads

Please find information below to address the four points list above. It should be noted that this assessment is based on the information available at the time and the actual effects of a development at this location will depend on the type and size of land-use proposed. Nevertheless, the initial transport assessment and this supporting information has taken into account the cumulative traffic effects of the soon-to-open Kindercare facility and of different potential land use developments on the plan change site. This analysis does indicate that (with the aid of appropriate mitigation measures) the road

network surrounding the site is capable absorbing the increased road usage in a safe and reasonable manner. It is noted that the proposed plan change provisions require resource consent for sizable developments and if those thresholds are triggered then a full assessment of the existing and proposed traffic impacts will be considered.

If you have any questions please get in touch.

Regards

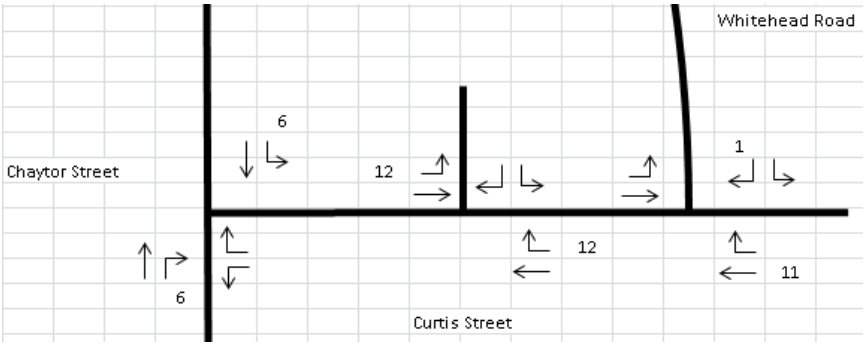
Sam Thornton
Senior Transportation Engineer

Kindercare Impact

I can confirm that our previous Transportation Assessment included the Kindercare traffic volumes in the do-minimum modelling scenario. The traffic generation and distribution due to the Kindercare development is shown below. This information was based on the PM peak hour flows predicted by the TDG report prepared for the Kindercare Resource Consent.

Arrivals (vehicles per hour)

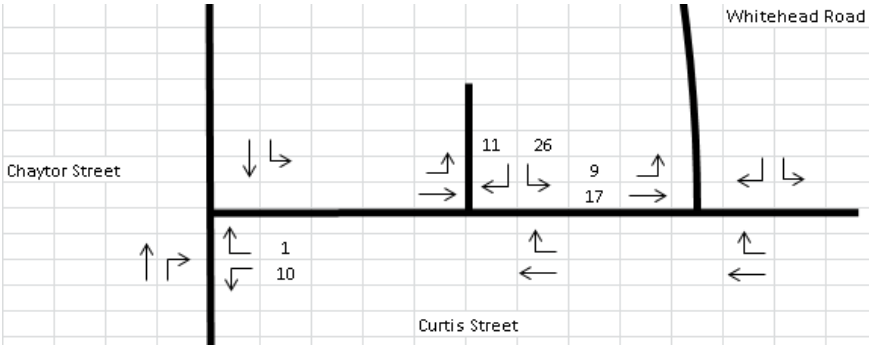
The predicted arrivals to the Kindercare site include 24 vehicles in the PM peak hour with an even distribution coming from either end of Curtis Street with the majority of traffic generated from east of the site (Northland and Wilton).



Departures (vehicles per hour)

The predicted departures from the Kindercare site include 37 vehicles in the PM peak hour with a similar distribution to the arrivals (the majority of traffic generated from east of the site (Northland and Wilton)). However the Karori bound traffic is predicted to use Whitehead Road/Old Karori Road (instead of Chaytor Street/Curtis Street).

The difference between the distribution of Karori traffic arrivals and departures is because of the priority afforded to vehicles using each route. Arrivals use Chaytor Street / Curtis Street as they do not have to give way to any other vehicles at intersections along the route (except the signals at Karori Road). Departures use Whitehead Road/Old Karori Road as the priority afforded to vehicles by the signals at Karori Road is more than the right turn out of Curtis Street against the heavy Karori bound flow.



The traffic volumes and distribution shown above was included in the do minimum SIDRA intersection model to model the performance of the Chaytor Street and Whitehead Road intersections with Curtis Street. The tables below summarise the performance of the Chaytor Street and Whitehead Road intersections performance in the PM peak hour (with and without the inclusion of the Kindercare development and including the proposed maximum plan change flows).

Curtis / Chaytor Weekday PM Peak 2017 Forecast	**Base + Predicted Growth**		**Base + Predicted Growth + Kindercare**		**Base + Predicted Growth + Kindercare + Plan Change**	
Approach / Lane	**Average Delay**	**LOS**	**Average Delay**	**LOS**	**Average Delay**	**LOS**
Chaytor Street (South) / Through	0.0	A	0.0	A	0.0	A
Chaytor Street (South) / Right Turn	9.0	A	9.1	A	9.2	A
Curtis Street / Left and Right	30.4	D	34.7	D	47.1	E
Chaytor Street (North) / Through and Left	0.1	A	0.2	A	0.4	A

The results from the model presented in the table above show that the Kindercare results 4-5 seconds additional average delay per vehicle on the operation of the Curtis Street / Whitehead Road intersection (without the proposed plan change). With the proposed maximum plan change flows (100 vehicles per hour[1]) the predicted additional average delay per vehicle is 17 seconds for Curtis Street traffic.

Curtis / Whitehead Weekday PM Peak 2017 Forecast	**Base + Predicted Growth**		**Base + Predicted Growth + Kindercare**		**Base + Predicted Growth + Kindercare + Plan Change**	
Approach / Lane	**Average Delay**	**LOS**	**Average Delay**	**LOS**	**Average Delay**	**LOS**
Curtis Street (East) / Through	4.9	A	4.9	A	4.9	A
Curtis Street (East) / Right Turn	8.4	A	8.7	A	9.0	A
Whitehead Road / Left and Right	7.9	A	8.3	A	8.9	A

[1] Refer section 6.6 of the Transportation Assessment

Curtis Street (West) / Through and Left	5.1	A	5.2	A	5.2	A

The results from the model presented in the table above show that the Kindercare has virtually no impact (less than half a second additional average delay per vehicle) on the operation of the Curtis Street / Whitehead Road intersection (without the proposed plan change). With the proposed maximum plan change flows (100 vehicles per hour) the predicted additional average delay per vehicle is 1 second.

Rat-running / effects on local roads

Rat-running

Analysis using route-finding software has shown the following preferred routes from surrounding suburbs to any proposed development on the site.

Origin / destination	Route	Length	Time
Wilton	Wilton Road and Curtis Street	2.1 km	3 min
From Karori	Karori Road, Chaytor Street, Curtis Street	1.8 km	3 min
To Karori	Karori Road, Old Karori Road, Whitehead Road, Curtis Street	1.6 km	3 min
From Northland	Randwick Road, Curtis Street	0.85 km	2 min
To Northland	Curtis Street, Chaytor Street, Raroa Crescent, Northland Road	0.9 km	2 min
Kelburn	Upland Road, Glenmore Street, Chaytor Street, Curtis Street	1.6 km	4 min
From CBD	Bowen Street, Glenmore Street, Chaytor Street, Curtis Street	4.3 km	9 min
To CBD	Curtis Street, Chaytor Street, Glenmore Street, Upland Road, Glasgow Street, Kelburn Parade	4.3 km	10 min

The analysis shows that the preferred routes follow collector or arterial routes. Rat-running on local roads is unlikely as any alternative routes to those above will generally be longer, narrower and afford lower priority for through vehicles.

The exception to this is Randwick Road for Northland based traffic. Randwick Road varies in width from 8.9m to 4.3m and has an indicative AADT of 780-1130 (approximately half that of Curtis Street between Chaytor Street and Whitehead road).Randwick Road functions as a through route for some Wilton traffic travelling to and from Kelburn and some Northland traffic travelling to and from Karori. The additional traffic on Randwick Road due to the proposed plan change is estimated to be approximately 10 vehicles[2] per hour which will have no effect on the traffic performance of Randwick Road

Rat running generally occurs due to slow vehicles or significant delays at intersections. Further analysis on potential rat-running routes is provided below.

[2] 25% of forecast additional traffic east of Whitehead Road intersection.

Route	Indicative AADT[3]	Origin / destination	Difference in Length	Difference in Time
Rosehaugh Avenue and Seaforth Terrace	170-300 vehicles per day	To Karori	+0.5 km +30%	+1 min +30%
Farm Road	250-730 vehicles per day	From Northland	+0.15 km +20%	< 1 min
Creswick Terrace	130-590 vehicles per day	From Northland	- 0.1 km - 10%	< 1 min

The table shows that:

- Rosehaugh Avenue and Seaforth Terrace are unlikely to be used as a rat running route as it will be a 30% increase in time and distance and the Karori bound exit to Rosehaugh Avenue is a stop controlled intersection with Priority to Old Karori Road.
- Farm Road is unlikely to be used as a rat running route as it will be a 20% increase in distance over using Randwick Road and has a tight curve with a steep access and limited visibility to Randwick Road.
- Creswick Terrace would be the shortest distance to any proposed development from Northland, however, the narrow (3.4-4.5m carriageway) winding nature of the route would make it unattractive and not worth the saving in time and distance. In addition unless drivers are very familiar with the area they are unlikely to be aware of its existence. Also it is only likely to be the shortest route for a small portion of Northland residents and those living north of the shopping area will likely use Randwick Road or Albemarle Road to get to Curtis Street / Wilton Road. Based on my experience as a local to the area and as a Transportation Engineer I don't think Creswick Terrace will be used as a rat-run to the site.

Other effects

Concerns have been raised about the effect on nearby roads including; Creswick Terrace, Randwick Road, Paisley Terrace, Farm Road, Seaforth Terrace, Rosehaugh Avenue, Karori Road and side streets. The table below highlights the effects of the change in traffic volumes due to any development on these roads. These numbers are based on the threshold of 100 additional trips per hour identified in section 6.6 of the Transport Assessment using the distribution identified in section 5.2 of the Transport Assessment in a 2017 forecast year.

Local Road	Adjacent Collector Road	Increase in traffic on collector route (per hour)[4]
Creswick Terrace	Curtis Street	Saturday 50 / 239 = 21%

[3] From the NZTA Crash Analysis System

[4] The traffic increase is two-way flow measured against the forecast 2017 flow (increased flow / forecast flow = increase proportion).

		Weekday 50 / 223 = 22%
Randwick Road / Farm Road	Curtis Street	Saturday 45 / 662 = 7% Weekday 45 / 602 = 7%
Seaforth Terrace / Rosehaugh Avenue	Old Karori Road / Whitehead Road	Saturday 15 / 441 = 3% Weekday 15 / 447 = 3%
Karori Road	Chaytor Street / Old Karori Road	Saturday 30 / 1940 = 2% Weekday 30 / 1902 = 2%

There are no known issues with congestion for minor roads accessing Curtis Street (Creswick Terrace and Randwick Road) and therefore the 22% & 7% increases respectively on Curtis Street will have a less than minor impact.

Karori Road and Old Karori Road / Whitehead Road currently experience some congestion at the intersections during peak periods however the increase in volumes on these two main roads is minimal and will not affect the accessibility of the minor local roads.

Parking and site access provision

Parking

As recommended in section 7 of the Transportation Assessment the proposed plan change which requires that all car parking is to be provided within the proposed Curtis Street Business Area.

The Transportation Assessment provides maximum GFA's and minimum numbers of on-site parks for different land uses which have been sourced from the NZ Trips and Parking Database and provide the basis for estimating parking demand and appropriate parking provisions. See below:

Land –Use	Proposed GFA thresholds (based on parking and traffic generation)	Minimum number of parks per 100m² GFA[5]	Minimum number of parks
Industrial	4900m²	1	49
Bulk Retail	1500m²	2	30
Service Retail	500m²	5.5	27.5
Office	3600m²	3	108

These transportation assessment figures have been used to inform the provisions and land use thresholds in the proposed plan change. As such development that is not permitted in the proposed plan change will be assessed as part of a resource consent process that will require a transportation report which gives opportunity to consider on-site parking provision.

Access Provision

Section 8 of the Transportation Assessment highlights likely locations where accesses might be located based on grades into the site.

Any accesses will have to comply with the WCC District Plan rules which requires the following for traffic safety reasons:

- A set distance from any intersection (10-20m)
- Sight lines to oncoming traffic (40m)

Any proposed activity which does not comply with these requirements will be non-compliant with the district plan and will be subject to a resource consent process.

[5] Sourced from the NZ Trips and Parking Database

Suitability of trucks on narrow roads

Further to the tracked path analysis undertaken as part of the previous assessment the following identifies areas on the surrounding roads where the road width constrains the use of large trucks.

For this assessment we have assumed that 3.0-3.5m lanes are necessary for full unhindered access. The table below shows the road widths on the surrounding road network.

Road section	**Kerb to kerb width (m)**	**Parking common**	**Useable lane width (m)**
Chaytor Street (at Birdwood Street)	12.4	1 Park, 1 Bus lane	3.5
Chaytor Street (at Curtis Street)	12.3	1 Bus lane, 1 turn bay	3.2
Chaytor Street (halfway up hill)	9.4	No	4.7m
Karori Road (at Standen Street)	11.4	2 Bus stops	3.2
Old Karori Road (at Fire Station)	10.2	2 Park	3.1
Old Karori Road (at Rosehaugh Avenue)	5.8	No	**2.9**
Old Karori Road (at Seaforth Terrace)	7.9	No	4.0
Whitehead Road (at Curtis Street)	7.3	No	3.7
Curtis Street (north of Whitehead Road)	6.7	No	3.4
Curtis Street (south of Whitehead Road)	6.4	No	3.2
Curtis Street (north of Old Karori Road)	6.2	No	3.1
Curtis Street (south of Old Karori Road)	6.2	No	3.1
Curtis Street (north of Chaytor Street)	6.9	1 Park	**2.5**

The table shows that generally the surrounding roads meets the requirements of 3.0-3.5m lane widths. The two pinch points are on Old Karori Road at Rosehaugh Avenue and Curtis Street north of Chaytor Street. These locations are shown in the aerials below.

Curtis Street – width constrained by parked vehicles

This is an existing problem as the width is inappropriate for a road classified as a Principal Road.

Comment [n1]: Not helpful! Highlights existing safety concerns. Delete?

Sorry, I disagree, we are providing a balanced view of the impact.

Old Karori Road – width constrained by adjacent infrastructure

The traffic counts undertaken as part of the previous assessment show the following proportions of heavy vehicles (daily average). Note that in this assessment a heavy vehicle is any vehicle larger than a van/car/SUV

Road	Light vehicles	Heavy vehicles	% Heavies
Chaytor Street	13,026	641	4.7%
Curtis Street	2,206	85	3.7%
Old Karori / Whitehead Road	3,892	88	2.2%

The current number of heavy vehicles on Curtis Street and Old Karori / Whitehead Road is relatively low with flows equating to approximately one heavy vehicle every 5-10 minutes.

The plan change has the potential to significantly increase the relative number of heavy vehicles on Curtis Street. As a worst case assumption if a development resulted in 25% heavy vehicles of the proposed 100 additional trips per hour[6] then this would equate to approximately a 150 percent increase in heavy vehicle trips per hour on Curtis Street. In this scenario, the overall proportion of heavy vehicles on Curtis Street in 2017 would increase from 3.7% to 7.9%[7].

This increase in heavy vehicles could be safely accommodated along the majority of Curtis Street, however, the pinch point at the southern end and the performance of the intersection with Chaytor Street would degrade noticeably if mitigation measures were not undertaken. As discussed, the plan change includes provisions such that; if significant numbers of heavy vehicles are predicted then that activity would be subject to a specific resource consent or transportation assessment. The specific resource consent or transportation assessment would assess the specific application would assess the predicted impact of that particular activity and would provide an opportunity for mitigation measures to be imposed if required.

The simplest option to mitigate this impact would be to restrict parking on southern Curtis Street (noting this would adversely affect local residents).

Other options to mitigate these concerns could include:

- Conditions on development for a travel plan which could require heavy vehicles not to access the site during peak hours. This would require heavy vehicle movements to access the site at times of low traffic flow and therefore reduce the effect they would have on the surrounding road network.
- Widening of the road, however, this would potentially be expensive and have significant effects due to the surrounding topography.
- Restrict parking on southern Curtis Street and provide an alternative off-street parking facility for local resident's.

[6] Refer section 6.6 of the Transportation Assessment
[7] (88*[1+0.02*5]+125) / (2206*[1+0.02*5]+375) = 7.9%