CCL Ref: 14649-050721-haynes

5 July 2021

CARRIAGEWAY
CONSULTING

A. PO Box 29623, Christchurch, 8540
P. 03 377 7010
E. office@carriageway.co.nz

Sean Haynes
Wooing Tree Development Partnership LP

By e-mail only: seanhaynes@veros.co.nz

Dear Sean

Response to EPA Matters

Further to recent e-mails, we understand that two transportation matters have been raised by the EPA. This letter responds to those queries, and for ease of reference we have adopted the same numbering as in Mr Duthie's proforma letter.

Matter 8: Traffic speeds on State Highway 8B / suitability of refuge

We confirm that the maximum permitted traffic speed at present is 80km/h, and traffic speeds are of his magnitude because vehicles on the highway do not need to stop or give-way to other vehicles. However the point of our comment was that with a roundabout in place at Barry Avenue, it will no longer be possible for drivers to travel at this speed in the immediate area. If any other vehicles are present, then it is likely that vehicles on the highway will need to slow (or at least, considerably slow) at the give-way lines of the roundabout. Even if no other vehicles are present, a vehicle would only be able to negotiate the roundabout at a speed of 40km/h (the design speed of the circulating carriageway). In short, the roundabout, as well as providing a means to access the Wooing Tree site, also acts as a speed reducing measure.

With this in mind, there is only a limited distance between the proposed Wooing Tree roundabout and the roundabout at the State Highway 6 / 8B intersection, for a driver to speed up. According to the Austroads Guide to Road Design Part 3 ('Geometric Design'), a car can accelerate by 1km/h for every 5m of travel (paragraph 3.5.6). Therefore to reach the current speed limit of 80km/h, if the vehicle has negotiated one of the roundabouts at the maximum speed of 40km/h (which assumes that no other vehicles are present - the speed will be slower if the driver has had to stop for another vehicle), this will take a distance of 200m. It would take a further 165m to slow down from this speed before reaching the next roundabout where the driver may also need to stop. However the distance between the two roundabouts is only around 525m.

That is, at best, the speed profile would be:

- 0m to 200m: speed up from 40km/h to 80km/h;
- 200m to 360m: travel at 80km/h; and
- 360m to 525m: slow down for the next roundabout.

If the driver has had to stop at the roundabout, the speed profile would be:

- 0m to 380m: speed up from 0km/h to 76km/h; and
- 380m to 525m: slow down for the next roundabout

In the latter case of a vehicle stopping at the roundabout, there is insufficient distance between thr two roundabouts for it to speed up to 80km/h before having to slow for the next roundabout.

As such, irrespective of the formal speed limit, we do not consider that the average operational speed on this section will remain at 80km/h. Rather, because of the presence of the roundabouts, it will be slower. In our view it is not good practice to sign a speed limit that is higher than can be achieved in practice, and as set out in the Transportation Assessment, a reduced speed limit supports a safer roading environment.

In respect of the refuge, this comment was made in the context of whether there were alternatives to the underpass. As we identified several years ago when contributing to the plan change for the site, one issue with underpasses is that they result in an increased walking time for pedestrians as they must descent and ascend. Conversely, walking at-grade provides the shorter and faster journey. As such, regardless of the presence of the underpass, we expect that a proportion of pedestrians will naturally prefer to cross the highway at-grade unless there are physical measures to prevent this (this is supported by the author's research when preparing the NZTA Pedestrian Planning and Design Guide several years ago).

The particular question relates to the safety of refuges if the vehicle speeds are more than 60km/h. As will be evident from the assessment above, if the refuge is located within 165m of the Wooing Tree roundabout, then vehicle speeds will necessarily be lower than 60km/h due to drivers having to slow down (and potentially stop) at the roundabout. This is not dependent upon any formal reduction in the speed limit.

Matter 9: The traffic assessment identifies shortcomings with respect to turning areas and queuing space in car parking for the non-residential aspect of the development. Please provide details of the solution to those shortcomings along with revised plans

The Transportation Assessment (paragraph 9.4.16) set out that "*in respect of queuing space, the District Plan requires 6m of queuing space for a car park with 20 to 100 spaces and 15m for car parks of larger capacity. Queuing space is measured from the site boundary to the point where conflict with vehicles in the site may arise. The majority of the car parking areas do not provide the required amount of queuing space. Waiting vehicles will therefore obstruct either the adjacent footpath or the adjacent traffic lanes*."

We show below the parking spaces that would need to be removed to achieve the required queuing space.

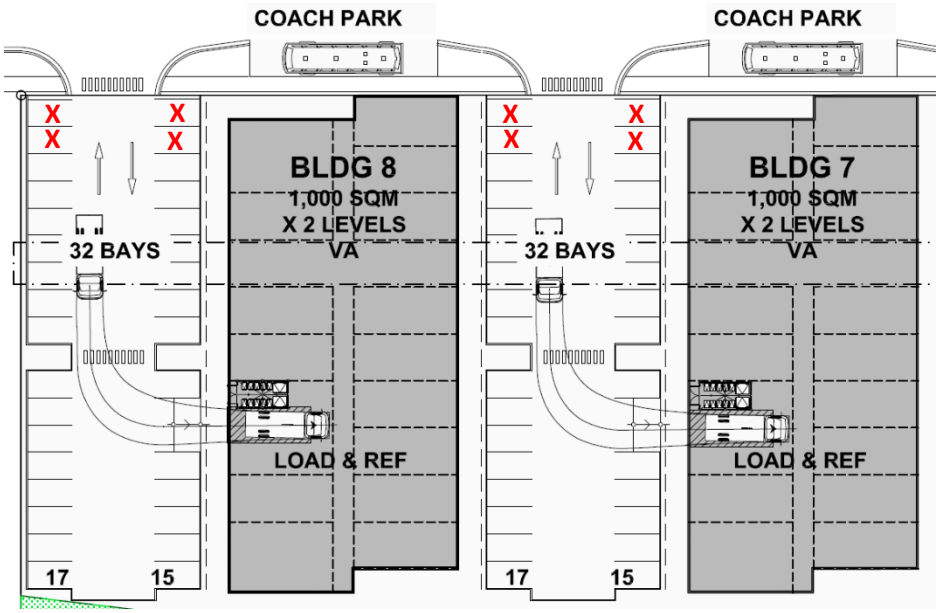

Figure 1: Parking Spaces to be Removed to Create Queuing Space

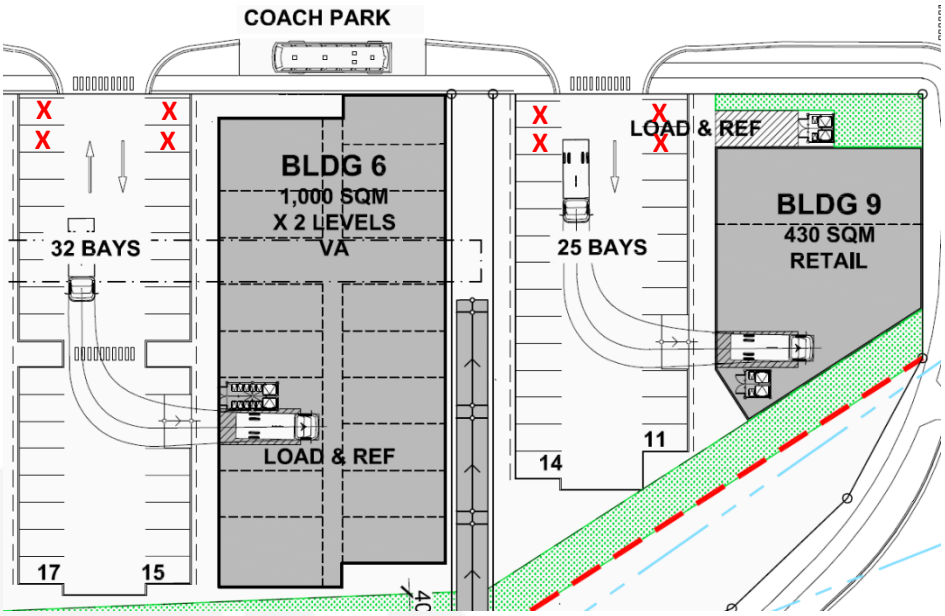

Figure 2: Parking Spaces to be Removed to Create Queuing Space

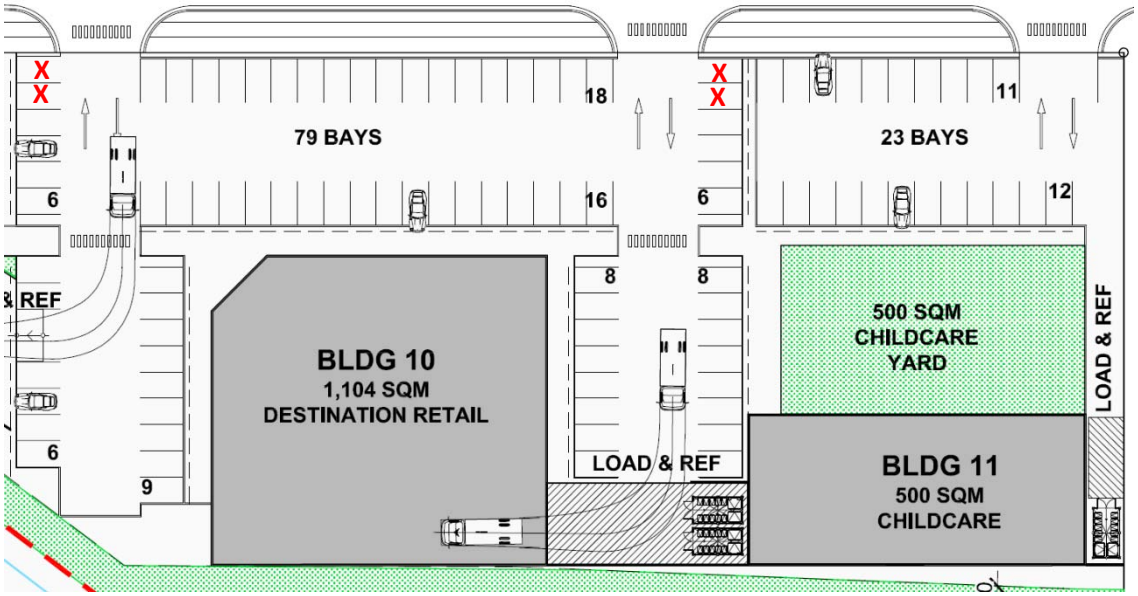

Figure 3: Parking Spaces to be Removed to Create Queuing Space

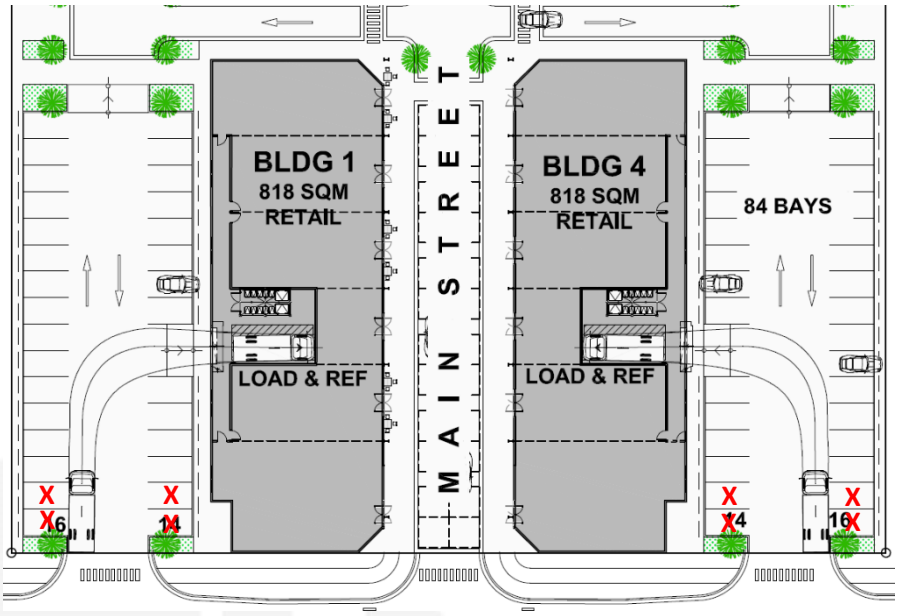

Figure 4: Parking Spaces to be Removed to Create Queuing Space

It can be seen that in total, 28 spaces should be removed to achieve a complying queuing space.

In paragraph 9.4.10 of the Transportation Assessment we noted that there was an overall parking requirement for 281 spaces and 307 spaces were shown, that is, an overprovision of 26 spaces. However in producing this letter we note that there is an error in the numbering on the drawing – the parking area near Building 2 is noted as having 14 spaces but 22 spaces are shown. The provision made within the site is therefore:

- Building 1: 30 spaces
- Building 2: 22 spaces
- Building 3: 8 spaces
- Building 4: 30 spaces
- Building 5 & 10: 79 spaces
- Building 6: 32 spaces

- Building 7: 32 spaces
- Building 8: 32 spaces
- Building 9: 25 spaces
- Building 11: 23 spaces
- Total: 313 spaces

Removal of 28 spaces to achieve a complying queuing space will therefore mean that the site continues to meet the parking space ratios of the District Plan.

That said, the issue of queuing space arises because of the need to ensure that an entering vehicle is not obstructed by another vehicle moving to or from a space. One relevant and practical mitigation technique is therefore to reserve those spaces within the queuing space (as identified above) for staff only. Staff arrived prior to customers arriving, and depart after the bulk of customers have departed, meaning that it is very unlikely that a staff vehicle will be manoeuvring at the same time as a customer vehicle enters. Consequently, it would be possible to retain the spaces shown above and to mark them for staff only.

With regard to turning areas, this issue only arises in the car parks to the east and west of Building 10, where it is possible that a driver will enter the car park and find all spaces occupied (meaning they would then have to reverse for an extended distance, and over a marked zebra crossing to be able to turn their vehicle). We recommend that two spaces are removed to create a turning area, as shown below.

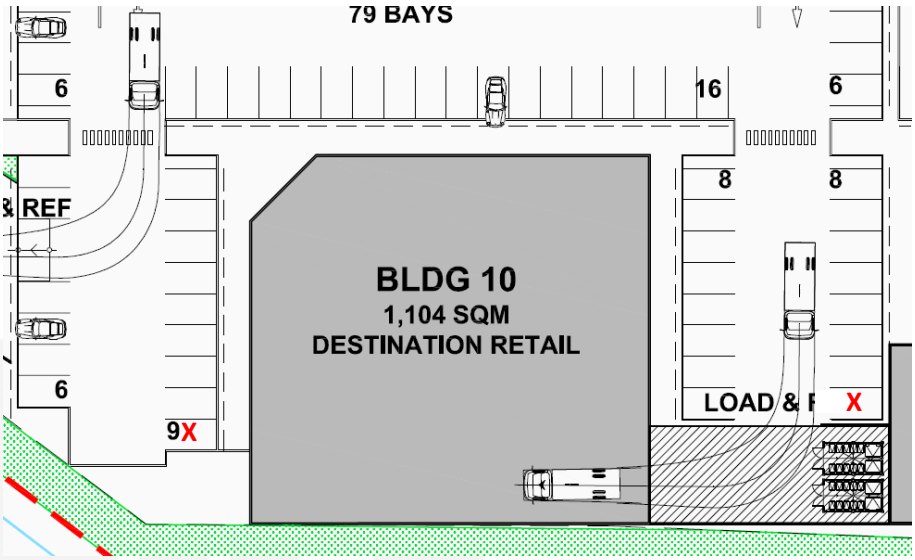

Figure 5: Parking Spaces to be Removed to Create Turning Area

This removal od 2 spaces reduces the on-site parking to 283 spaces (taking into account the loss of spaces to providing queuing space) which continues to meet the required parking ratio of 281 spaces.

I trust that this is of assistance, but please do not hesitate to contact me if you require anything further or clarification of any issues.

Kind regards
Carriageway Consulting Limited

Andy Carr
Traffic Engineer | Director

Mobile 027 561 1967
Email andy.carr@carriageway.co.nz