

15 June 2018

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By e-mail only: tim@williamsandco.nz

Dear Tim

Proposed Special Housing Area, Lake Hawea Township: Additional Information

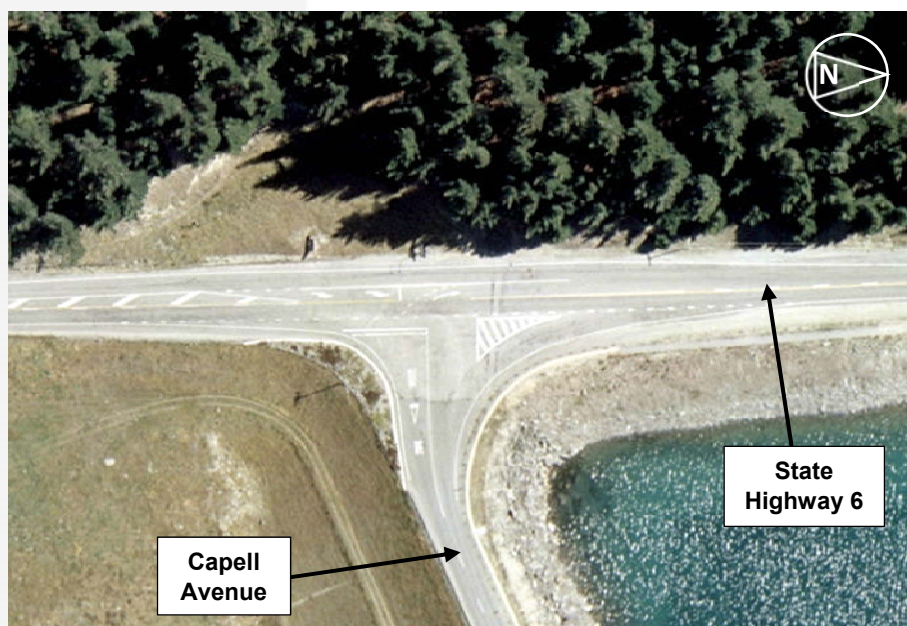
Further to our various emails and conversations, we understand that Queenstown Lakes District Council has requested additional information regarding the operation of the State Highway 6 / Capell Avenue intersection.

This letter sets out the expected change in performance of the intersection if the proposed Special Housing Area (**SHA**) was to proceed. It draws on the earlier Transportation Assessment (dated 23 May 2018).

Existing Intersection Layout

The State Highway 6 / Capell Avenue intersection is formed as a high-capacity priority ('give-way') intersection with auxiliary turning lanes for the movements from State Highway 6 both left and right into Capell Avenue. There is a raised island at the end of Capell Avenue to separate eastbound and westbound traffic. The Capell Avenue approach is widened at the intersection to enable two vehicles to queue side-by-side.

Unusually, there is an arrow located within the centre of the intersection to guide drivers turning northwards into the correct traffic lane.



Photograph 1: State Highway 6 / Capell Avenue Intersection



Photograph 2: State Highway 6 / Capell Avenue Intersection Looking North

The speed limit on State Highway 6 in this location is 100km/h and thus sight distances of 285m are required for turning traffic. Towards the south, the sight distance is limited by the horizontal curve of the highway but a distance in excess of 300m is available. Towards the north, the sight distance is limited by the topography (as can be seen on Photograph 2) but 285m is achieved.

Transportation Patterns

Existing Volumes

The New Zealand Transport Agency (**NZTA**) carries out a programme of surveys on the state highway network. There are two traffic count stations close to the intersection noted as being “north of dam” (reference 00600880) and “south of dam” (reference 00600884). In 2017, the Average Annual Daily Traffic north of the dam was 1,113 vehicles, with a volume of 2,956 vehicles observed to the south of the dam. Further assessment of the traffic flows from the NZTA database enables the traffic flows on the highway to be derived (based on the 85th percentile weekday).

We have also recently carried out surveys further to the east of Capell Avenue which enables the volumes on this road to be identified also.

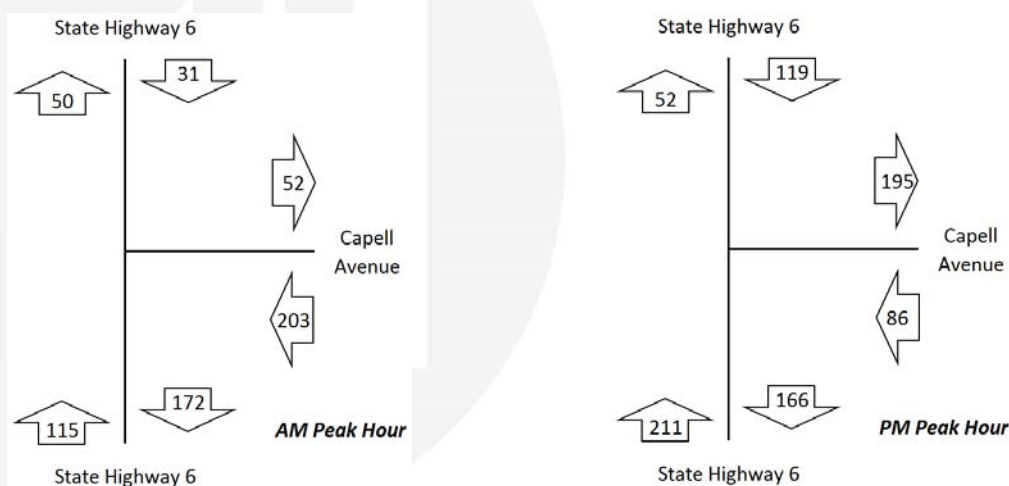


Figure 1: 2017/18 Observed Weekday Peak Hour Traffic Flows



Based on these traffic flows, we have synthesized the expected turning volumes. The critical element of this is the proportion of vehicles that turn to the north and south at Capell Avenue. Based on the prevailing volumes, we consider that 80% of the traffic exiting Capell Avenue will turn to the south and the direction of Wanaka with 20% turning north.

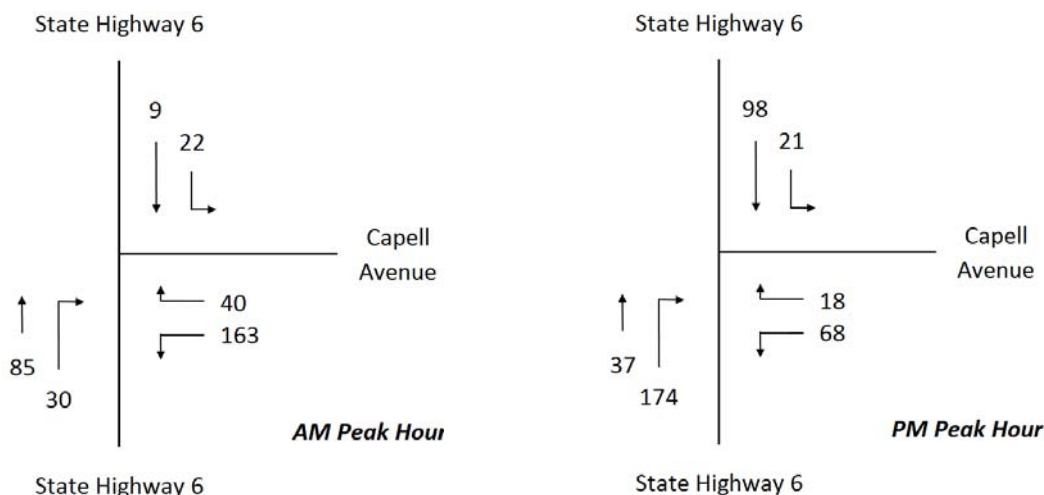


Figure 2: Synthesized Turning Volumes

Future Volumes

As set out in our previous Transportation Assessment, there are new subdivisions at Timsfield and Sentinel Park which will increase traffic flows in the area further. Allowing for the same traffic generation volumes set out in Section 4 of the Transportation Assessment, peak hour volumes on Capell Avenue could increase as follows:

- In the morning peak hour, 360 vehicles exit Capell Avenue and 40 vehicles enter; and
- In the evening peak hour, 140 vehicles exit Capell Avenue and 260 vehicles enter;

This gives rise to the following expected volumes:

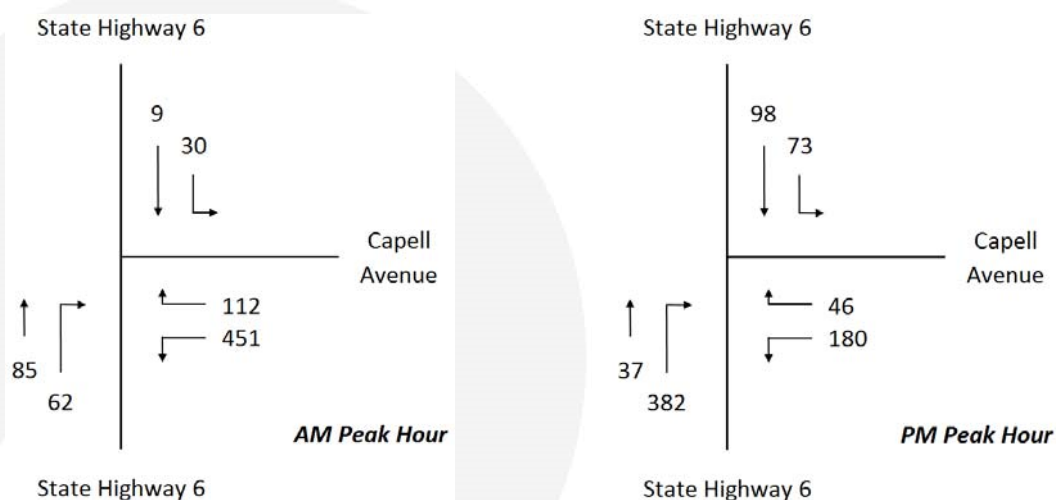


Figure 3: Synthesized Turning Volumes Plus Consented/Permitted Development

Intersection Queues and Delays

We have used the computer software program Sidra Intersection to model the performance of the intersection under these traffic loadings and the results are summarised below.

Road and Movement		Morning Peak Hour			Evening Peak Hour		
		Avg Delay (secs)	95 %ile Queue (veh)	Level of Service	Avg Delay (secs)	95 %ile Queue (veh)	Level of Service
State Highway 6 (south)	R	7.7	0	A	8.1	1	A
Capell Avenue	L	4.7	2	A	5.2	1	A
	R	5.6	1	A	8.7	0	A
State Highway 6 (north)	L	8.7	0	A	11.0	0	B

Table 1: Peak Hour Levels of Service at the State Highway 6 / Capell Avenue Intersection with Consented/Permitted Development (No SHA)

It can be seen that under these traffic volumes, the intersection operates with low queues and delays and an excellent level of service in both the peak hours.

Road Safety

We have used the NZTA Crash Analysis System to identify the reported crashes within 50m of the intersection, for the most recent full five years (2013 to 2017) plus the partial record for 2018. This shows that over this time period, no crashes have been recorded. We therefore examined the previous five years (2008 to 2012) and again found that no crashes had been recorded.

Proposed Development

As set out in the Transportation Assessment, the proposed SHA will result in an additional 400 residential sections being constructed. Based on the traffic generation rates used in the Transportation Assessment (which in turn are the same as those assumed for the Timsfield and Sentinel Park subdivisions) this will result in the following traffic volumes at the State Highway 6 / Capell Avenue intersection:

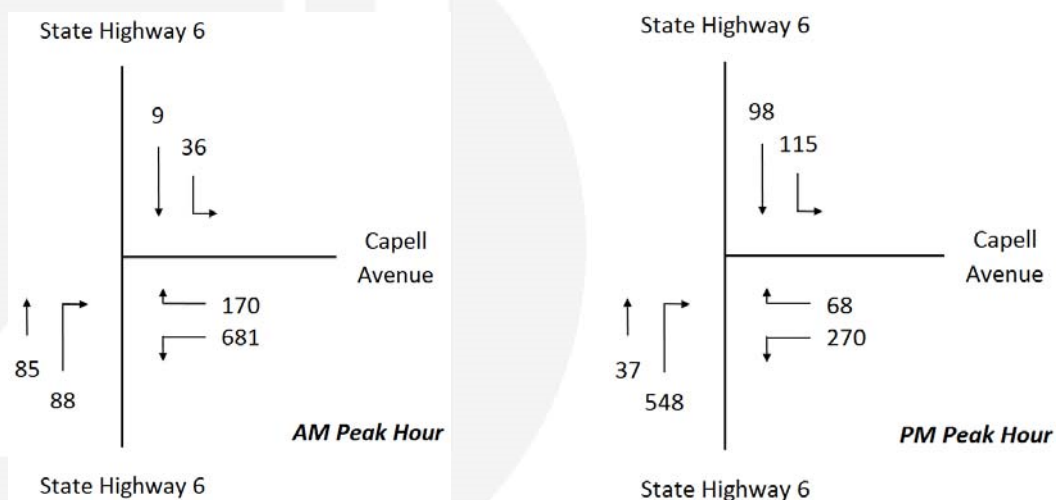


Figure 4: Synthesized Turning Volumes Plus Consented/Permitted Development Plus SHA



We have again used the computer software program Sidra Intersection to model the performance of the intersection under these traffic loadings and the results are summarised below.

Road and Movement		Morning Peak Hour			Evening Peak Hour		
		Avg Delay (secs)	95 %ile Queue (veh)	Level of Service	Avg Delay (secs)	95 %ile Queue (veh)	Level of Service
State Highway 6 (south)	R	7.7	0	A	8.1	2	A
Capell Avenue	L	4.7	4	A	5.2	1	A
	R	5.9	1	A	11.6	1	B
State Highway 6 (north)	L	8.8	0	A	13.2	1	B

Table 2: Peak Hour Levels of Service at the State Highway 6 / Capell Avenue Intersection with Consented/Permitted Development plus SHA

It can be seen that the traffic arising from the SHA has only a small effect on queues and delays at the intersection. Levels of service remain very good, and the greatest increase in delay per vehicle is only around two seconds.

With regard to road safety, the intersection has an excellent record and we therefore do not anticipate that any adverse effects will arise from the additional traffic volumes generated by the SHA.

Conclusions

On the basis of our assessment, we consider that the proposed SHA will have a negligible effect on the safety and efficiency of the State Highway 6 / Capell Avenue intersection.

Please do not hesitate to contact me if you require anything further or would like clarification of any matters.

Kind regards

Carriageway Consulting Limited

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