

<b>REPORT TO:</b>	Kendyll Harper, SWDC [5/5/2021]	<b>CC:</b>
<b>FROM:</b>	David K. Wanty, Wanty Transportation Consultancy; CPEng, M.ITE	
<b>RC200149:</b>	Quarry and trucking operation, Underhill Road, Featherston	
<b>ISSUE DATE:</b>	19/5/2021	<b>REVISED:</b>
		<b>SITE VISIT(S):</b> 12/5/21

## 1. Background

This is a peer review for South Wairarapa District Council (SWDC) relating to an Application entitled Proposal to crush and stockpile aggregate by PJ Warren Earthmoving Ltd, relating to an existing site off Underhill Road approximately 3.2 km from SH2 Featherston. The following documents were provided:

- 200149 - Application 22102020 59p Russel Hooper Consulting, 22/10/20
- 200149 - Site plan 22102020 1p Russel Hooper Consulting, 14/10/20
- 200149 - GWRC consent 22102020 18p, Greater Wellington Regional Council (undated)
- UnderhillRd16Feb21letterHF 4p, Traffic Assessment, Harriet Fraser, 16/2/21

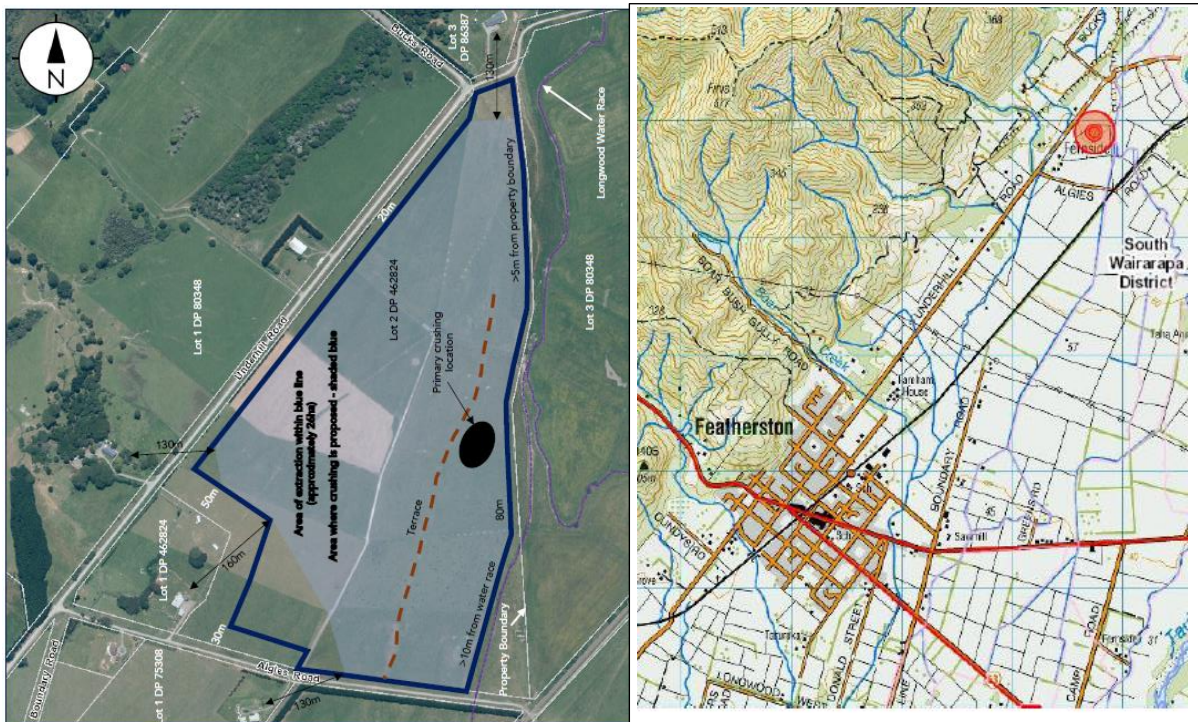


Figure 1: Site plan, GWRC report Figure 1, and Council aerial of SH2 at Wakefield St.

The key issue of concern related to the SH2 intersection with Wakefield St.

The SH2 Fitzherbert Street carriageway is nominally 14.2 m between kerb faces with a nominal 2.5 m flush median provided principally for the right turn into SH53 Revans Street (east) southeast of SH2. There is a portion of Revans Street (west) northwest of SH2 and Wakefield Street which is Stop controlled and on an oblique angle. Wakefield Street carriageway is stated as 11.6 m but was measured by SH2 as 11.9/12.0 m with a 5.7 m northbound lane. SH2 was measured east of Wakefield St as 14.1 m carriageway with a 2.4 m flush median; the eastbound shoulder was 2.7 m and a 3.4 m traffic lane, while westbound shoulder was 1.2 m and 4.4 m traffic lane.

## 2. Traffic and Safety review

### 2.1. Road safety

While the crash history was reported in the Traffic Assessment letter report, an examination of the crashes on SH2 in the vicinity of Wakefield Street was undertaken for 2015 to 2020 (plus part 2021 as at 7/5/2021). Grouping by 20 m results in one group of 3, one group of 5 and a single crash east of SH53 for the area as shown below – the collision diagram is also shown.

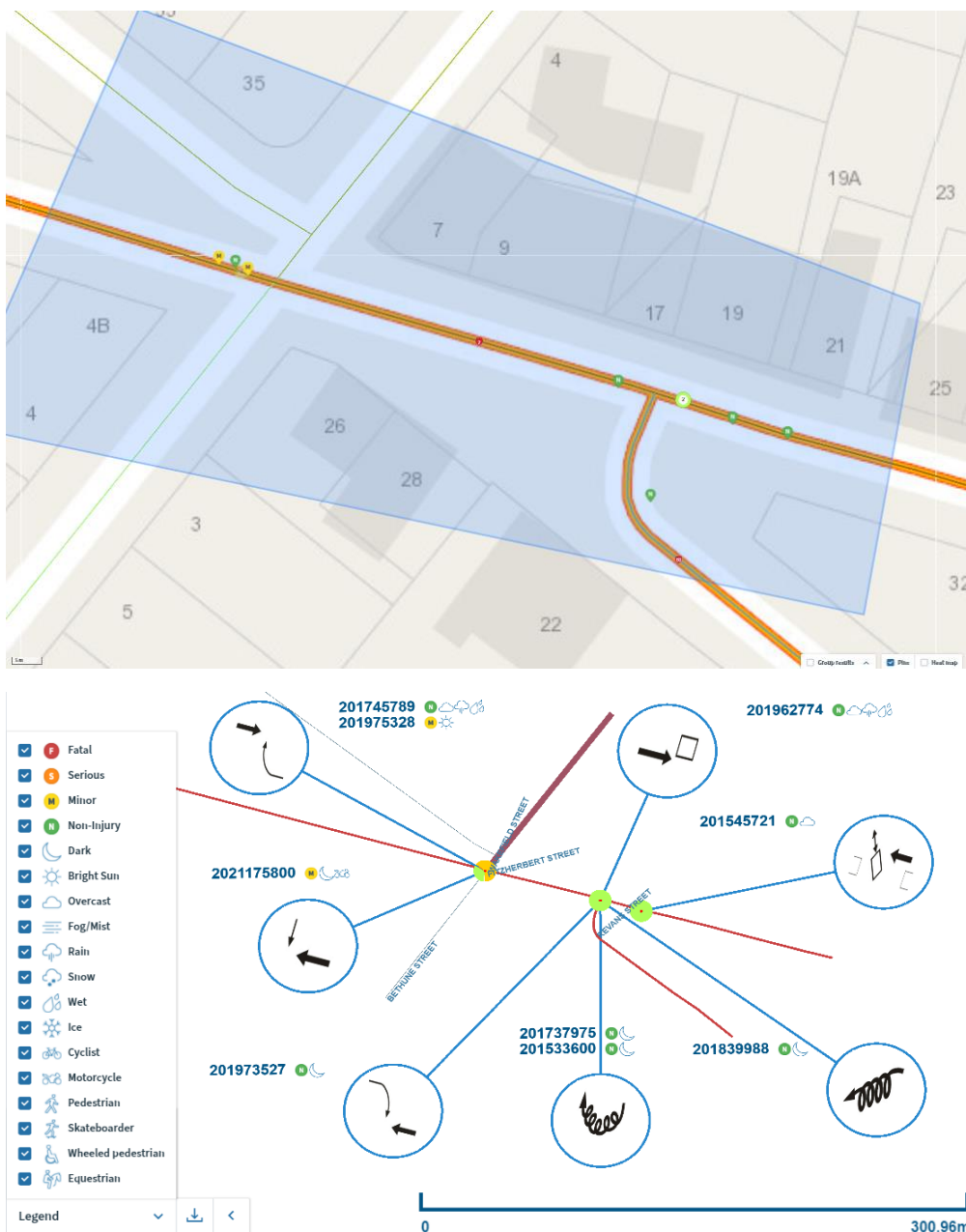


Figure 2: Reported crashes



## 2.2. Road safety risk

An examination was also undertaken of MegaMaps III (formerly Safer Journey Investigation Tool).

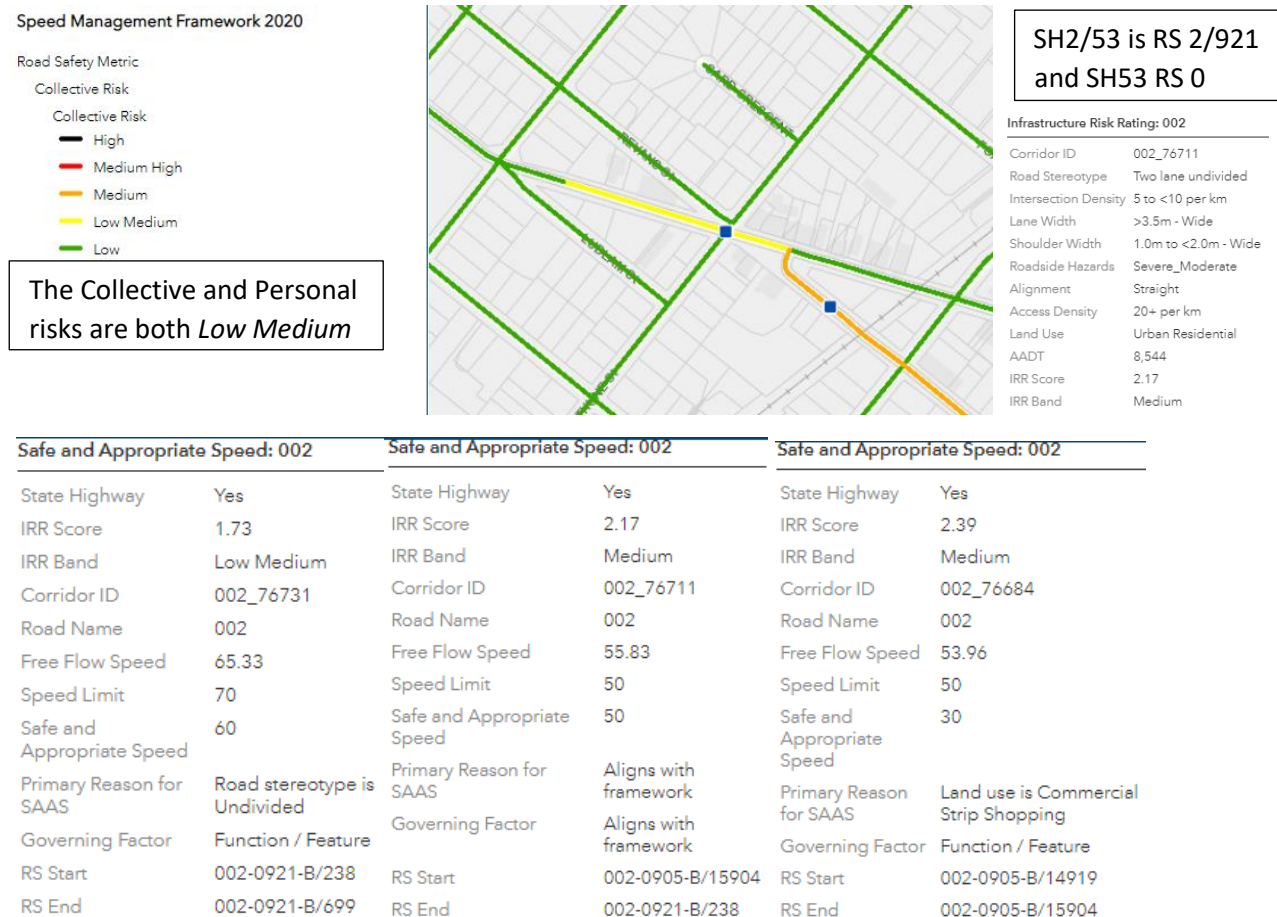


Figure 3: MegaMaps III assessed risk (based on 2015-2019 injury crashes)

## 2.3. Traffic link volumes

An examination of the Mobile Road App revealed the following estimates of the Average Daily Traffic and percentage of heavy vehicles – the RAMM carriageway width (m) is also given

• Bucks Rd sealed	Low Vol	30 Jan'94 10%	5.5
• Underhill Rd north unsealed	Low Vol	30 Jan'94 10%	4.5
• Underhill Rd mid sealed	Access	153 Aug'12 0%	5.5
• Underhill Rd by Bush Reserve	Access	50 Jan'99 6%	7.0
• Underhill Rd south of Titoki Gr	Access	402 Apr'01 6%	7
• Wakefield St south of Underhill	Access	997 May'08 0%	11
• Wakefield St mid	Access	250 Jan'99 6%	11
• Wakefield St north of SH2	Access	781 Aug'98 6%	11
• Bethune south of SH2	Low Vol	150 Jan'94 6%	8
• Revans W of Wakefield	Access	275 Jan'09 0%	10.4
• SH2 Remutaka	Regional	7380 Dec'19 6.4%	8
• SH2 west of Wakefield St	Pri. Collector	8856 Dec'19 6.4%	13
• SH2 between Wakefield & SH53	Pri. Collector	8856 Dec'19 6.4%	13
• SH2 east of SH53	Pri. Collector	9208 Dec'19 5.7%	13
• SH53 southeast of SH2	Pri. Collector	2612 Dec'19 5.9%	13

The annual variation of daily traffic flows on SH was examined using the NZTA Traffic Monitoring System for the continuous sites on Remutaka Hill (Upper Hutt side) and east of Featherston. Closer examination of February 2019 and 2020 flows was also undertaken.

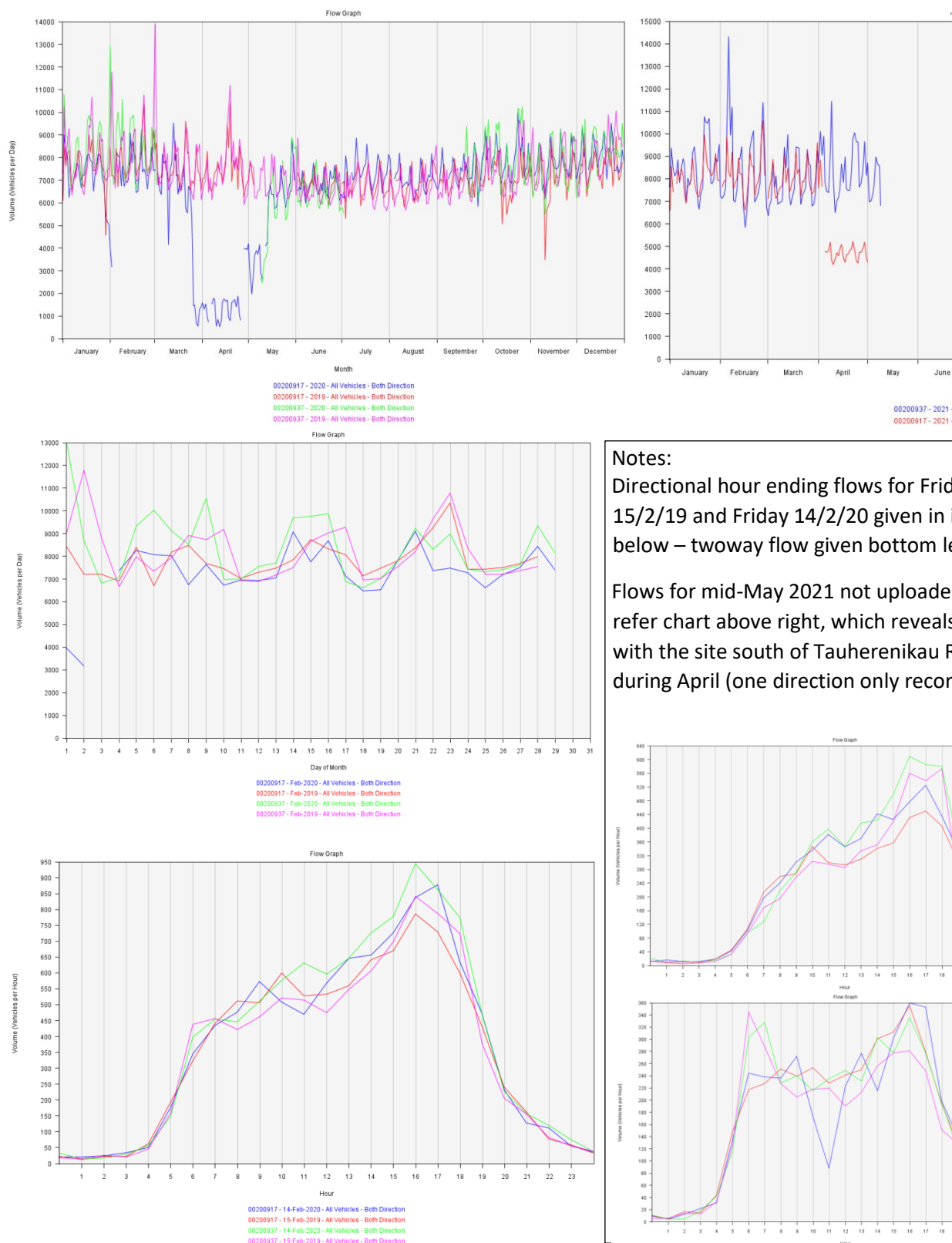


Figure 4: NZTA TMS Graphs for SH2

## 2.4. SH2 Wakefield Street intersection flows

When driving back from the 20<sup>th</sup> Waka Kotahi NZTA / NZIT annual conference in Napier, I undertook a 24 minute special traffic survey at the SH2 intersection with Wakefield Street on Wednesday 12 May 2021. The results for the survey are given below, which also includes the nearby right turn into SH53.



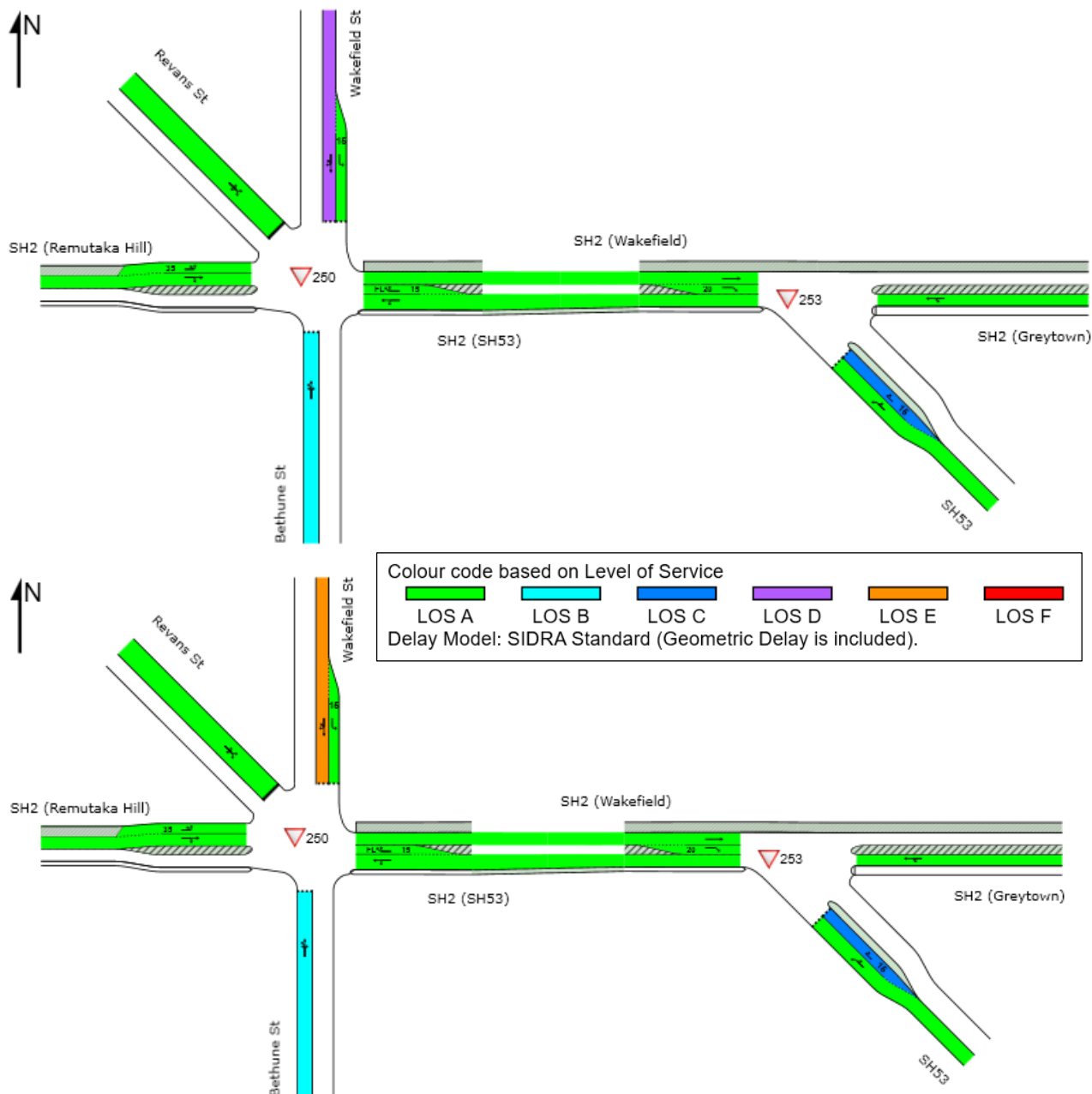


Figure 6: Level of Service for existing PM survey (top); added development light and heavy traffic (bottom)

The potential impact of the additional development traffic with a laden truck turn right out of Wakefield St is an increase in the right turn out delay from 26½ (LoS D) to 41 seconds, just beginning LoS E. It is unlikely though that laden trucks would be leaving the quarry at this time to turn right and already a large gap (8 s) is required for even light traffic (SIDRA by default multiplies this by 2.5 for large trucks). Modelling it as a usual truck (default multiplier 1.5 ) results in a 31½ second delay (LoS D) which is considered more realistic.

Accordingly based on the surveyed traffic flows, probably higher than the usual before 5 pm flows, the quarry operation impact on the SH2 Wakefield Street intersection during the critical weekday late afternoon period is likely to be no more than minor based on current year flows. With respect to future flows allowing for a potential increase in SH2 traffic of 10% somewhat surprisingly appears not to affect the right turn out delay noting that reduction in the gap for increased opposing flow has not been applied (the default).

The length of the flush median between Wakefield Street and SH53 appears to be sufficient to accommodate SH2 right turning traffic for both side roads.



## 2.6. Other issues

The existing SH2 flush median at Wakefield Street is slightly narrower than the legal minimum of 2.5 m for a lane and consideration should be given to slightly widening it and possibly mark a right turn bay similar to that at SH53 (which is also narrow and may or may not be 2.5+ m wide).

The SH53 westbound approach lane to SH53 is quite narrow (has a wider shoulder) and there should be opportunity to widen the existing flush median between Wakefield St and SH53 plus their approaches. This is a matter which Waka Kotahi could consider now, independent of any additional quarry traffic.

Site visibility for vehicles exiting Wakefield Street is reasonable except when vehicle might be turning left out at the same time as a vehicle turning right out. However a truck driver turning right out should be able to see over the roof of a car turning left out, since a truck driver is seated much higher. A vehicle turning left out of Wakefield St can in effect creep over the Give Way line to see past a vehicle waiting to turn right, due to the nature of the intersection layout.

I did observe one car waiting to turn right out of Revans Street give up to turn left since they were blocked by a vehicle waiting to turn right out of Wakefield Street. After turning left I am unsure if they did a U-turn (Wakefield St is wide enough to readily U-turn). The eastern end of Revans Street (west) could potentially be partially or fully closed to motor vehicle traffic which would then simplify the SH 2 Wakefield Street intersection although there was surprisingly quite a few vehicles turning into it from SH53 westbound as well as from Bethune St. Unlike Underhill Road there are practical alternatives off SH2 to the west to access Revans Street (west) – turning right into Fox Street for a truck and trailer is not so practical given the pedestrian refuge being approx. only 21 metres from the right turn bay hold line.

With respect to the impact on Wakefield St and Underhill Road users, this has not been part of my project scope but a brief drive-over following the survey did not reveal any issues of major concern. The route has minimal delineation and has an unsealed narrower straight section (open road speed limit applies but corrugations limit the comfortable speed) and can accommodate additional site traffic. The traffic assessment identified only one single vehicle lost control minor injury crash along Wakefield St/Underhill Road in January 2021 and stated that “sightlines to and from frontage properties and at intersections are generally good” which I have no reason to disagree from the brief driveover.

If approving this Application Council could consider installing a Trucks Crossing sign for the northbound direction (no real need for the southbound direction). I also noted that the 100 km/h sign approx. 1.3 km from SH2 is on the right hand side – legally it is required on the left hand side. The gravel road sign, to which an orange cow warning sign has been attached, did not appear to give much warning, Council could consider relocating it more in advance and/or add flag lighting to the pole opposite the #321(2123) access where the end of seal occurs, approx. 0.46 km south of Algies Road. I did remark on my video that sight visibility was a bit obstructed to the left (north) from the #391 access just south of the Quarry site – but this was when raining and almost dark (refer image bottom right showing trees in the road reserve, site is on the right).



Figure 7: Underhill Road n/b approach to end of seal (left) at #321; #391 access image (right)

## 2.7. May 19, 2021 Conclusion

I opine that the effect of the quarry operation on the performance of SH2 in Featherston for the proposed Monday to Friday business hours is likely to be no more than minor. It is observed that the existing flush median along SH2 in Featherston is narrow with respect to catering for turning heavy vehicles and Waka Kotahi could consider widening it for the existing traffic including those turning right into SH53 (Revans Street east). Consideration could also be given by Waka Kotahi in conjunction with Council to the Wakefield Street end of Revans Street west, although the reported crash history does not suggest any pressing need to do so (and does not lead to consideration of a roundabout for example).

Council could consider installing a "TRUCKS CROSSING" warning sign if approved and once Quarry operations commence, this would probably only be needed for the northbound approach. I consider that the 100 km/h open road speed limit is inappropriate for a gravel road but expect in due course that it might be reduced (setting of speed limits is currently proposed to be regionally based, no longer by individual road controlling authorities except perhaps Gisborne District Council). I also opine that Council might consider giving more advance notice of the end of seal (to assist unfamiliar visitors to the Quarry, could also consider installing flag lighting on the pole close to where the seal/unsealed boundary occurs).

Accordingly I see no reason on traffic and safety grounds for Waka Kotahi to oppose this Application with respect to the impact on SH2 road users given that operations are restricted to standard weekday business hours.