

**Christchurch City Council**  
**City Services Team**  
**Planning & Delivery (Transport)**

## Memorandum

**Date:** 20<sup>th</sup> May 2021

**From:** **Hamid Mirbaha**, Senior Transport Network Planner - Specialist

**To:** **Richard Holland**, Team Leader - Transport Asset Planning

**CC:** **Dave Little**, Senior Planner Residential Red Zone

**Title:** **Avonside Drive closure – transport modelling**

### 1. EXECUTIVE SUMMARY

This memo summarises the assumptions and highlights the findings of a transport modelling undertaken for a proposed street closures on Avonside Drive between 748 Avonside Drive (Red Zone by Avon Park) and Kerrs Rd, and Kerrs Road to Wainoni Road.

The assumptions in relation to the modelling are as below:

- Kerrs Road remains fully open to access the current rowing facility at Kerrs Reach over the bridge. The Bridge remains open for vehicles cycling and walking.
- Avonside Drive remains open for cycling and walking to connect to the new bridge at Snell Place and Kerrs Reach in the meantime. It is acknowledged that this path may be part of the Avon-Otakaro Major Cycleway route. Snell Bridge is right on the bend of Avonside Drive.

A summary of the current road network is provided below:

- Avonside Drive is classified as a Collector Road in the District Plan. The function of a Collector Road is to provide access between the adjacent local streets and arterial network. Providing an access to cater for long distance trips is not a desired function of a Collector Road.

- The current daily traffic flows on Avonside Drive are around 2,500 vehicles per day. Considering the emptiness of the adjacent residential lands and closure of majority of the connected local streets the road is seemingly catering mainly to long distance trips between north-eastern suburbs and the central city.
- While traffic volumes along Avonside Drive are in the lower end of the range of traffic volumes for Collector Roads, vehicle speeds are high with average speeds around 55kph and 85<sup>th</sup> percentile speeds over 60kph. That is mostly due to the fact that the road looks like a rural road as a result of demolitions of the residential lands along it.

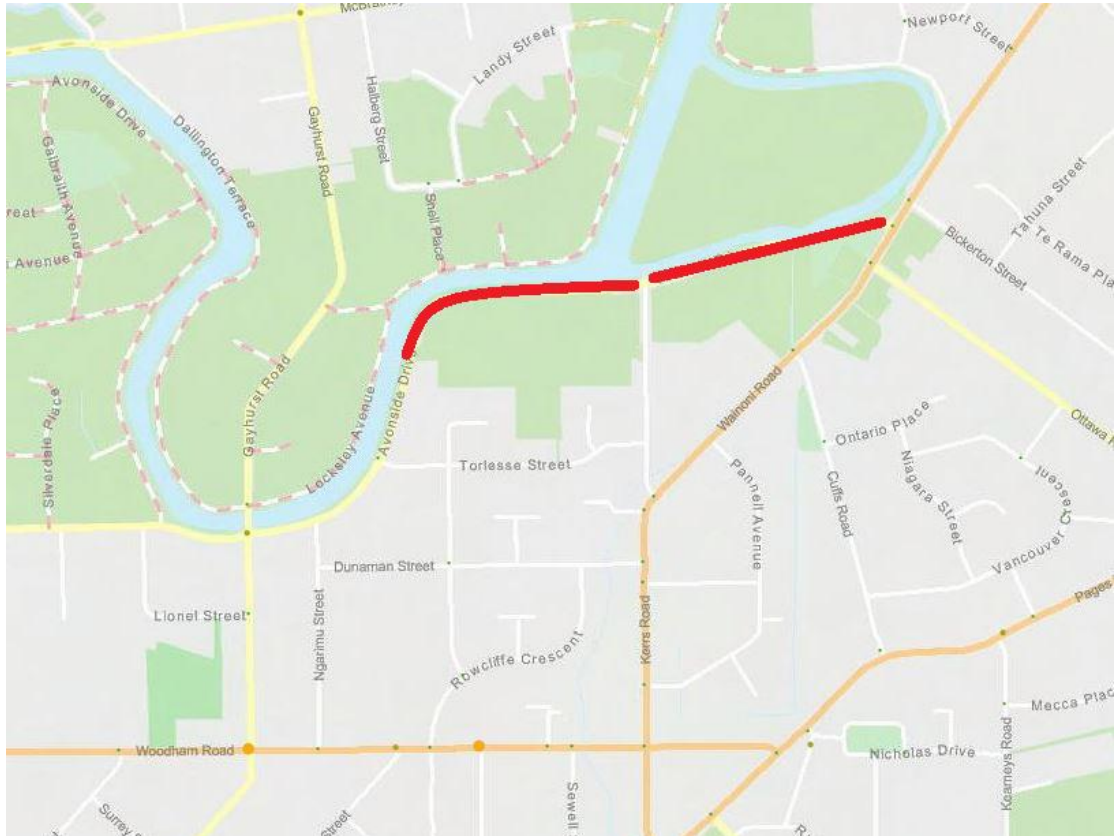
A summary of the transport model findings is presented below:

- The alternative alignment of Woodham-Kerrs-Wainoni is classified as Minor Arterial and provides a more direct route suitable for the longer distance trips.
- The volume of traffic on Woodham Road is currently 10,900 vehicle per day, which would increase to possibly 13,000 per day. This traffic volume is within the average range for a minor arterial road in Christchurch.
- The volume of traffic on Kerrs Road north of the Woodham Road roundabout is 14,500 vehicles per day which would increase to approximately 16,500 vehicles per day. This traffic volume is within the average range for a minor arterial road in Christchurch.
- The volume of traffic on Wainoni Road east of Avonside Drive is 15,200 vehicle per day. This traffic volume is unlikely to change noticeably as a result of the proposed Avonside Drive closure.
- Re-routing of traffic from Avonside Drive towards Woodham-Kerrs-Wainoni alignment would in-turn reduce the traffic flows on Retreat Road as well. This would mitigate the risks associates with double turns at the intersection of Avonside Drive/Gayhurst Road/Retreat Road.

Council would need to ensure signage is clear that Avonside Drive is now a cul-de-sac and at Gloucester Street (Gayhurst Bridge) the traffic is directed onto Woodham Road, and at Woodham Road/Kerrs Road roundabout towards Kerrs Road and Wainoni Road.

## 2. THE PROPOSAL

This report highlights the traffic modelling findings of a proposal to close Avonside Drive between 748 Avonside Drive (Red Zone by Avon Park) and Kerrs Road, and Kerrs Road to Wainoni Road to facilitate the implementation of the Avon River corridor regeneration plan. A map of the road network in the area including the sections of Avonside Drive subject to closure under this proposal is shown on the map below.



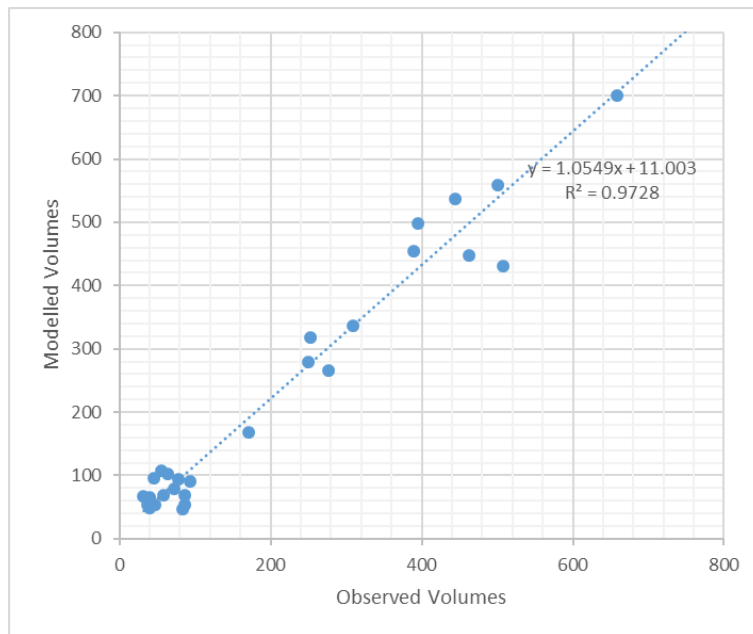
- Avonside Drive is classified as a Collector Road in the District Plan. The function of a Collector Road is to provide access between the adjacent local streets and arterial network. Providing an access to cater for long distance trips is not a desired function of a Collector Road.
- The current daily traffic flows on Avonside Drive are around 2,500 vehicles per day. Considering the emptiness of the adjacent residential lands and closure of majority of the connected local streets the road is seemingly catering to long distance trips between north-eastern suburbs and the central city.
- While traffic volumes along Avonside Drive are in the lower end of the range of traffic volumes for Collector Roads, vehicle speeds are high with average speeds around 55kph and 85%ile speeds over 60kph. That is mostly due to the fact that the road looks like a rural road as a result of demolitions of the residential lands along it.
- The alternative alignment of Woodham-Kerrs-Wainoni is classified as Minor Arterial and provides a more direct route suitable for the longer distance trips.

### 3. MODEL CALIBRATION & VALIDATION

For the purpose of traffic modelling of the proposed Avonside Drive Closure, CAST model V18a for the design year of 2021 is used. Using the most recent traffic counts at 5 below road sections in the area, the transport model is validated and calibrated.

- Retreat Road (west of Patten Street)
- Retreat Road (east of Patten Street)
- Avonside Drive (west of Kerrs Road)
- Gayhurst Road (North of bridge)
- Wainoni Road (North of Avonside Drive)

Validation results of the base model is exhibited in the below graph.



The graph indicates the base model overall over-estimates the traffic volumes by around 5%. The over-estimation puts the model in a more conservative range where effects are slightly exaggerated. Modelling guidelines specify a range of targets for validation of local area transport models.

GEH	<=5	<=7.5	<=10
Target	90%	95%	100%
Base model	90%	100%	100%

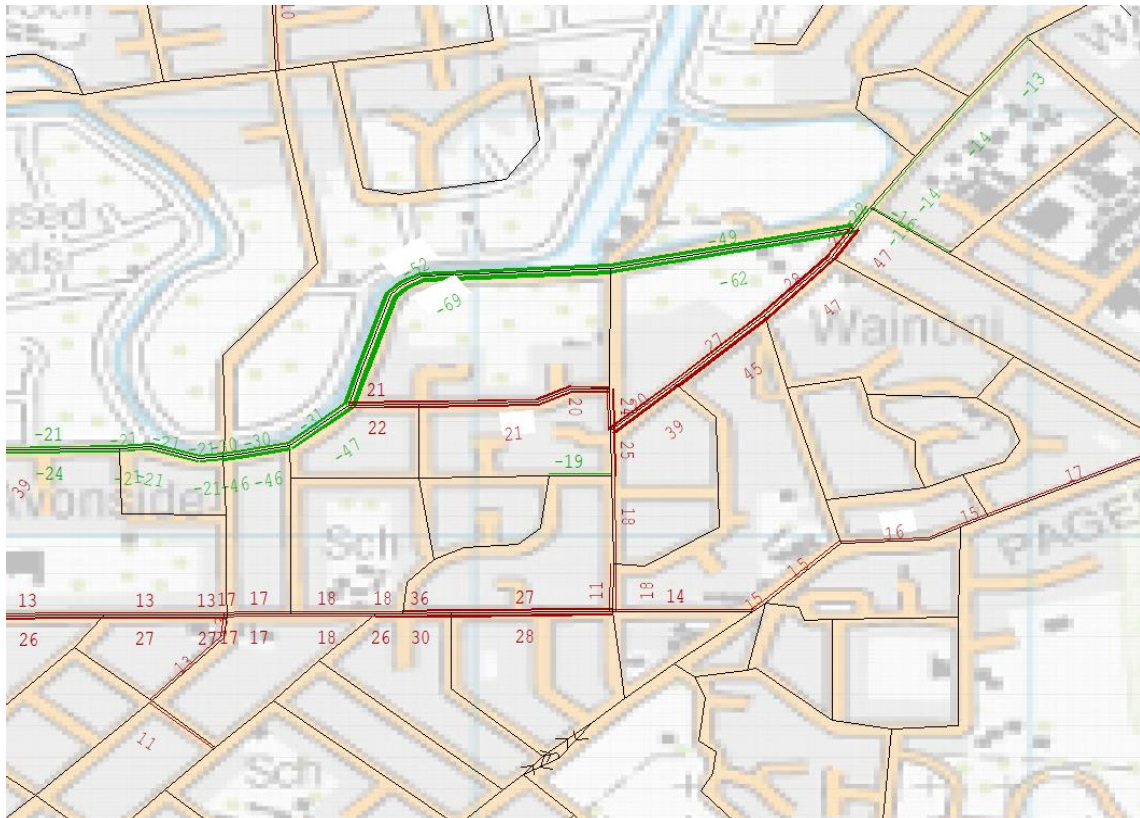
On this basis, this is confirmed that the base model has an appropriate match to the reality of traffic environment in the local area network.

#### 4. KEY FINDINGS

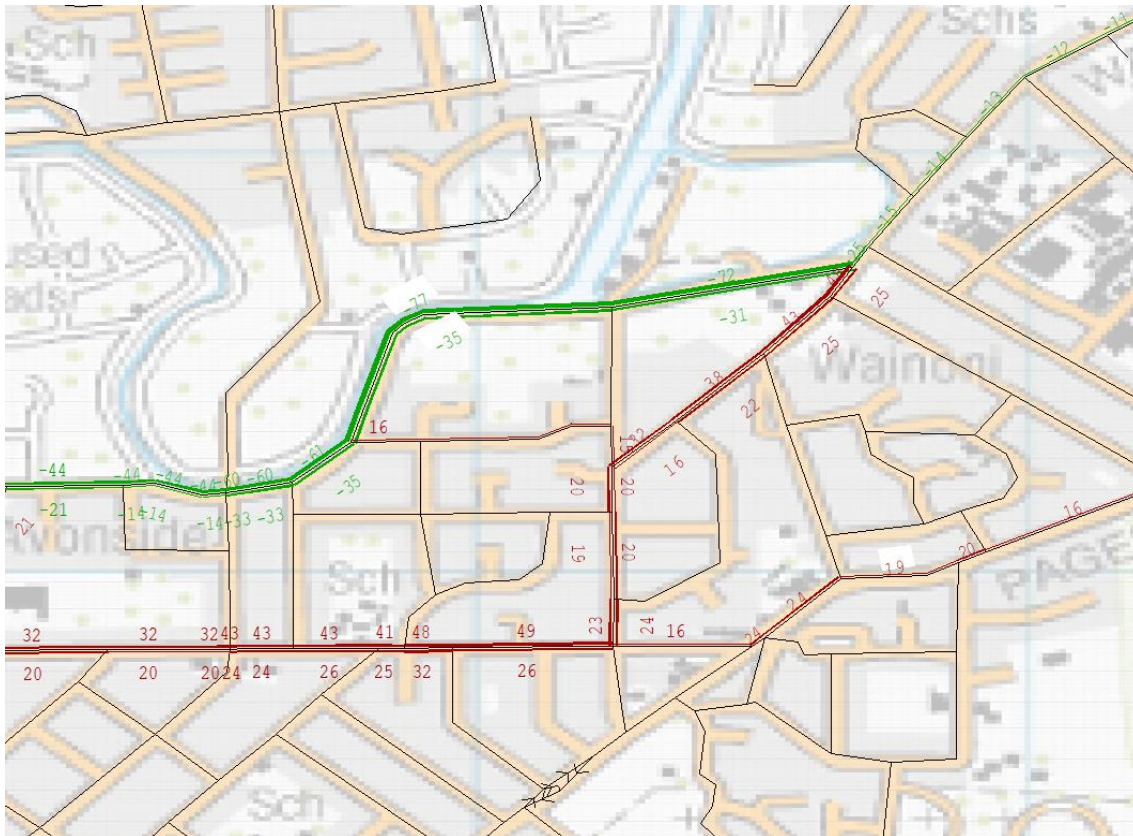
To investigate the medium terms impacts of the proposal on the network, the design year of 2028 is chosen.

The initial modelling suggested that if the sections of Avonside Drive are closed, the local streets of Torlesse Street and Dunarnan Street between the open section of Avonside Drive and Wainoni Road would become attractive for the traffic which otherwise uses Avonside Drive. Both Torlesse Street and Dunarnan Street, however, already have some traffic calming devices and raised platforms to reduce speeds and discourage rat-running through these residential streets. Hence the increased attractiveness of the streets is deemed unlikely and mostly due to simplifications in the transport model’s assumptions. The inconvenience of driving on raised platforms, the need for making additional turns and the lower overall speeds along Torlesse Street and Dunarnan Street would most likely discourage the long-distance traffic away from those alignments and keeps them on the arterial network.

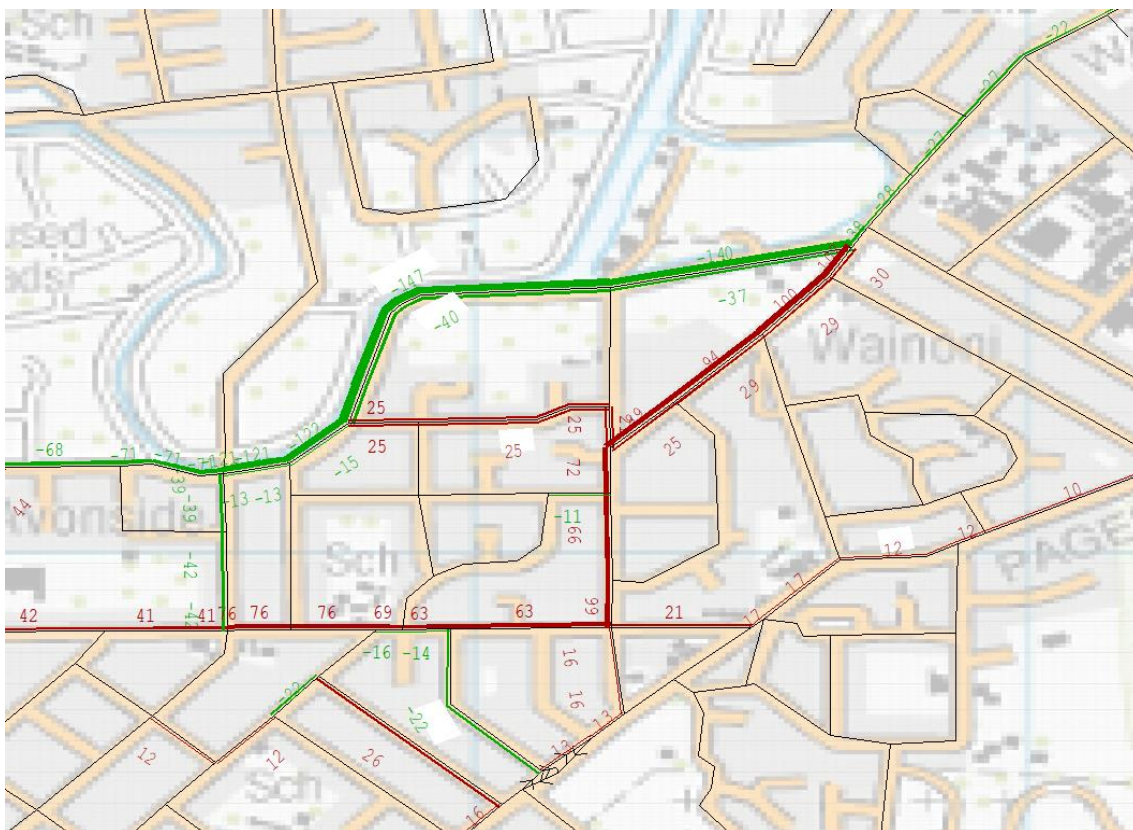
To address this anomaly, the travel time effects of the existing traffic calming devices are coded into the model as Scenario 2. Volume difference plots between the base model and Scenario 2 for AM, IP and PM peak hours are presented below. In the following plots green colour indicates a reduction in traffic volumes while a red colour represents an increase. Thickness of the lines indicate the intensity of the hourly volume change compared to the base conditions which is also presented as numbers of vehicles per hour.



AM peak 2028 – volume differences



IP 2028 - volume differences



PM 2028 - volume differences

The revised model suggests the following:

- Majority of the Avonside Drive traffic would move onto Wainoni-Kerrs-Woodham alignment. This is a positive move which relocates long-distance traffic from Collector Roads back onto arterial roads.
- No considerable additional delays are likely as a result of the road closure at the intersections along the Wainoni-Kerrs-Woodham alignment.
- The volume of traffic on Woodham Road is currently 10,900 vehicle per day, which would increase to possibly 13,000 per day. This traffic volume is within the average range for a minor arterial road in Christchurch.
- The volume of traffic on Kerrs Road north of the Woodham Road roundabout is 14,500 vehicles per day which would increase to approximately 16,500 vehicles per day. This traffic volume is within the average range for a minor arterial road in Christchurch.
- The volume of traffic on Wainoni Road east of Avonside Drive is 15,200 vehicle per day. This traffic volume is unlikely to change noticeably as a result of the Avonside Drive closure.
- Re-routing of traffic from Avonside Drive towards Woodham-Kerrs-Wainoni alignment would in-turn reduce the traffic flows on Retreat Road as well. This would mitigate the risks associates with double turns at the intersection of Avonside Drive/Gayhurst Road/Retreat Road.

## 5. CONCLUSION

Results of the traffic modelling suggests that the proposal is feasible and is not likely to create a noticeable traffic impact on the local area network. The alternative alignment of Wainoni-Kerrs-Woodham is likely to have enough capacity to accommodate the low volume of traffic in Avonside Drive.

The proposal has the side benefits or reducing traffic volumes at the high risk intersection of Avonside Drive/Gayhurst Road/Retreat Road. It would also reduce the risk of speeding along Avonside Drive and Retreat Road and could contribute to a higher level of pedestrian cycle safety along those roads.

Overall, the findings of this study supports the proposed closure of the sections of Avonside Drive between 748 Avonside Drive (Red Zone by Avon Park) and Kerrs Rd, and Kerrs Road to Wainoni Road and assesses the negative effects arising from it as minor.

Council would need to ensure signage is clear that Avonside Drive is now a cul-de-sac and at Gloucester Street (Gayhurst Bridge) the traffic is directed onto Woodham Road, and at Woodham Road/Kerrs Road roundabout towards Kerrs Road and Wainoni Road.