

# A ROUNDABOUT WAY OF GOING DUTCH

(This paper has been peer reviewed)

Drew Bryant, BEng (Nav Arch), CMEngNZ, (Presenter)  
Senior Infrastructure Planning Advisor – Transportation, Tasman District Council  
[drew.bryant@tasman.govt.nz](mailto:drew.bryant@tasman.govt.nz)

## ABSTRACT

The Champion/Salisbury roundabout is one of the busiest roundabouts in Nelson-Tasman. It's on the boundary separating Tasman District and Nelson City. The development of a new supermarket and on-going residential growth meant that the roundabout needed an upgrade. A panel of transport experts determined that adding an additional lane would solve the problems by providing additional capacity.

This determination failed to take into account 455 cyclists and 200 pedestrians that passed through this intersection daily. Council staff thought that the roundabout shouldn't be upgraded without improving safety and the experience for cyclists and pedestrians.

The initial evaluation determined that an underpass would be the best solution to provide safe passage through the intersection for pedestrians and cyclists, but development of the concept identified significant cost. Re-evaluation of the options identified that an at grade crossing provided the best value for money as long as safety for pedestrians and cyclists was not detrimentally affected. Council used a Dutch style roundabout as a starting point for the concept design and adapted the design to suit the context.

Construction of the new roundabout has seen an increase in the number of people walking and cycling across the intersection. Waka Kotahi is working on a similar roundabout on State Highway 60 in Motueka. Based on the success of these roundabouts, Council have identified three intersections in Richmond on primary cycle routes for an upgrade to a separated cycle way Dutch roundabout.

## INTRODUCTION

Richmond is a small town with a population of 18,000 residents within Tasman District. The town is nestled between the Barnicoat ranges, Tasman Bay, Nelson City boundary and the Waimea Plains. Richmond is growing fast with a population growth rate of 2.5% pa and growth in vehicle use around 5% pa.

The Champion Road and Salisbury Road intersection is right on the boundary separating Tasman and Nelson (as shown in Figure 1) and has about 18,000 veh/day going through it making it one of the busiest intersections in the area.

There is a cluster of seven schools, 700 metres from the intersection on Salisbury Road with a combined school role exceeding 2,500 students. There is another secondary school just 300 metres up Champion Road. On the four corners of this roundabout there are a number of destinations including an aquatic centre, a regional sports hub, a greengrocer and a brewery.

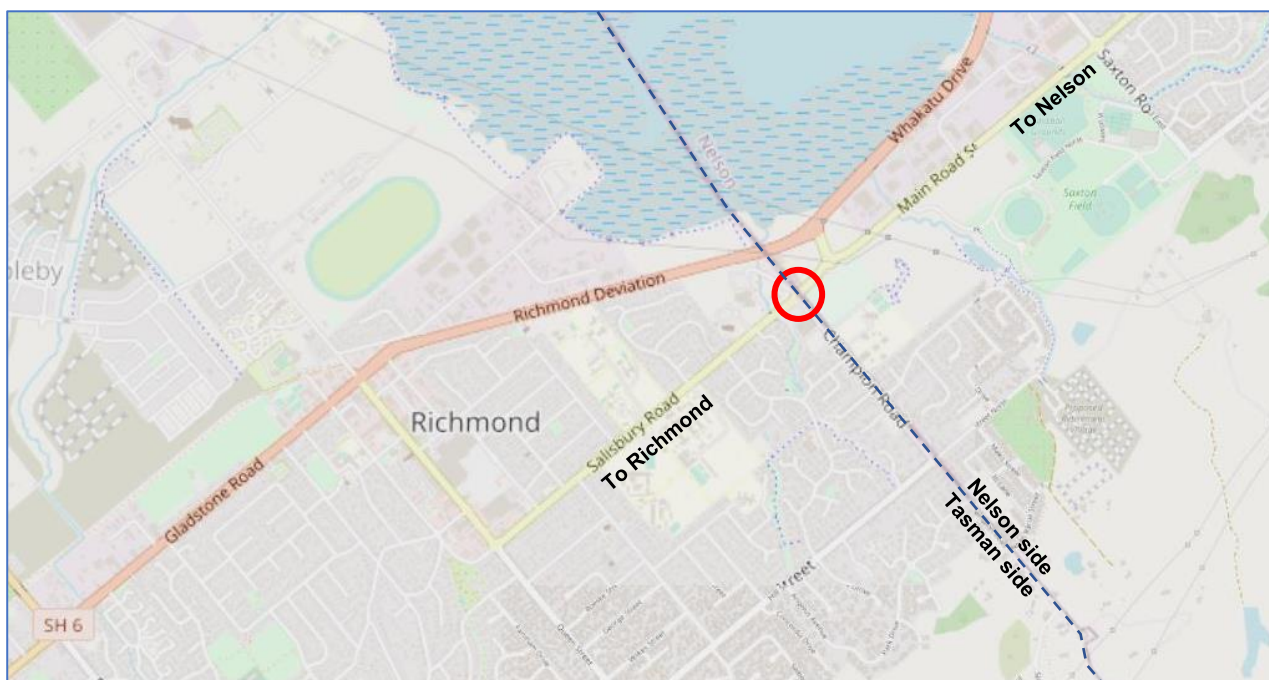


Figure 1: Location of the intersection

Woolworths Group, applied for a Plan Change to alter the district plan to allow for a Countdown supermarket to be constructed on one corner of the intersection. The most contentious aspect of the plan change was the traffic implications, not least the differing opinions as to the likely impact (both during and after construction). It was agreed by all parties that if the roundabout was upgraded to two lanes with a double lane approach from Richmond (Salisbury Road South) and Hill Street (Champion Road East) then the plan change could be passed. [Note – There is already a two lane approach on the Nelson side (Salisbury Road North), this upgrade would include two lane approaches from the Richmond side of Salisbury Road and the Champion Road side as shown in Figure 2].

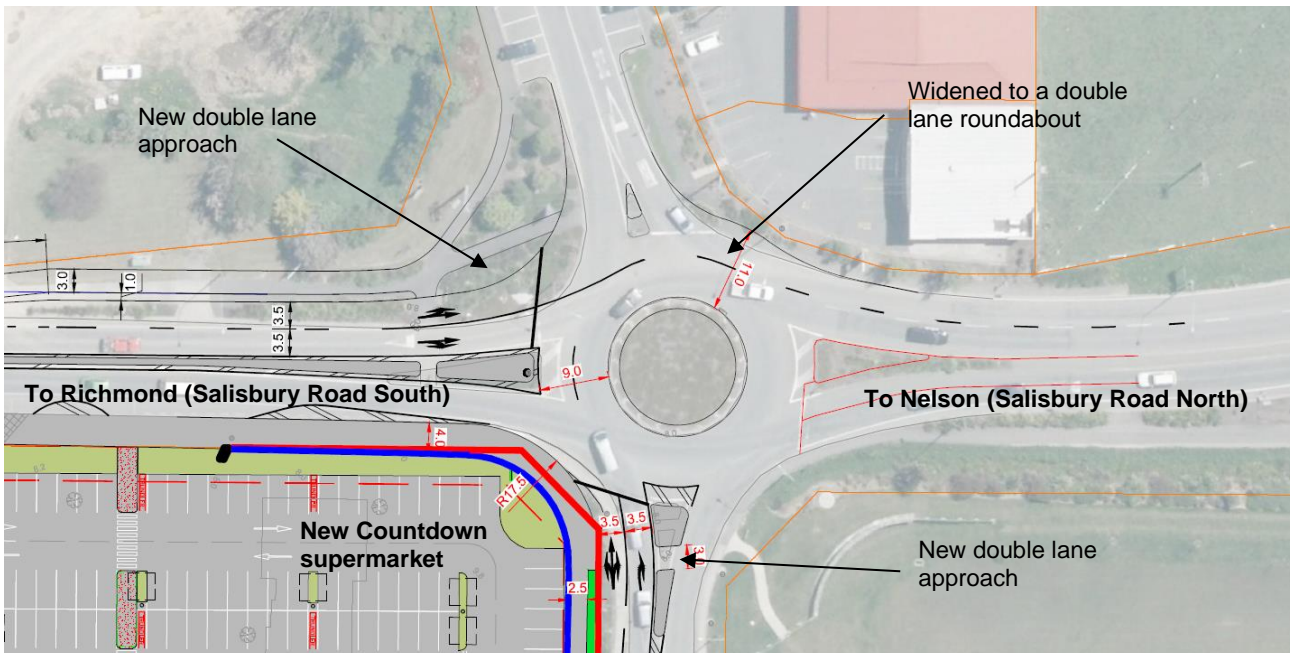


Figure 2: The recommended changes to the roundabout

## INITIATION

### Initial Concept

In 2018 the roundabout project was included in Tasman District Council's (Council) Long-Term Plan as a capital project for implementation. A review of the environment court requirements prompted Council officers to seek clarification about how walking and cycling were being catered for, especially in the context of the nearby schools and the proximity to the main cycling route between Nelson and Richmond as show in Figure 3 below.

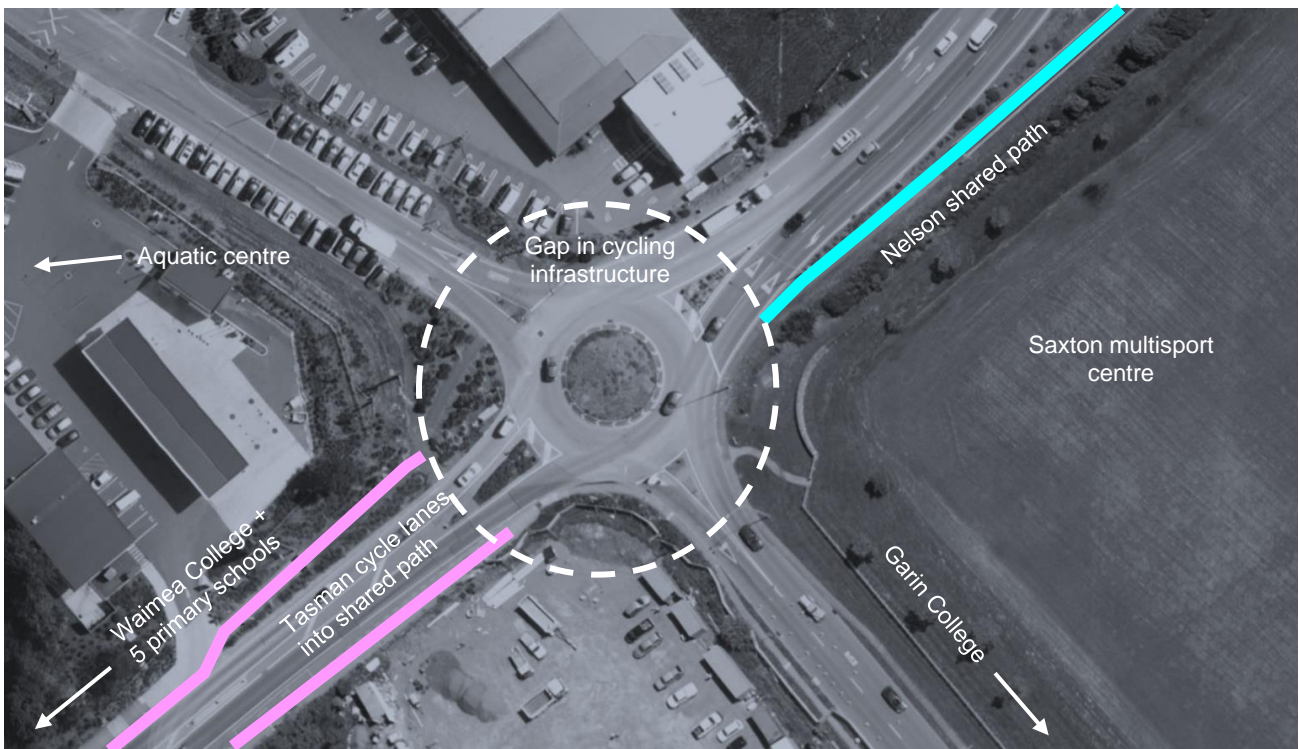


Figure 3: Existing cycling infrastructure

The objectives in addressing the intersection were:



- To provide for the additional traffic generated by the supermarket and general growth of the town;
- Ensure pedestrians and cyclists have a safe way to access the destinations around the intersection.

Initially this resulted in a proposal to include an underpass in the Long Term Plan to address the severance created by the multi-lane roundabout.

## EVOLUTION

### Business Case

In 2019, Council officers started the business case for the roundabout upgrade. Initially Council thought that the walking/cycling underpass was the best solution (early BCR seemed to confirm this from an economic perspective), however as further investigation was undertaken, the underpass concept began to seem less than ideal. Some of the reasons included:

- The cost of constructing the underpass escalated as various challenges were uncovered including:
  - high water tables
  - the number of services that would need to be modified
  - traffic management at this busy location
- Walking and cycling counts showed that there was a strong flow of people across Salisbury Road at the intersection, whereas only crossing Champion Road (the quieter side road) had been considered
- Concerns around crime with a long underpass and limited visibility from ground level
- Council was nearing the completion of a Network Operating Framework process. This reinforced the need for change on Salisbury Road to discourage general traffic along Salisbury Road and encourage walking, cycling and passenger transport.

Given escalating costs, reducing BCRs and aspects mentioned above it became apparent that a revised design was necessary that provided at grade crossings for walking and cycling, including on Salisbury Road. At this point, a raised walking and cycling crossing was providing the best BCR and Multi Criteria Analysis scores.

However, this outcome presented another challenge, public perception. So far, the underpass option had been the preferred solution in the public arena, and Council had already consulted affected parties on the underpass concept.

### Network Operating Framework

Council and Waka Kotahi were nearing completion on a Network Operating Framework (NOF) on Richmond. The purpose of the framework is to assist planning for the transportation network by identifying key routes for all modes, operational gaps in the network and interventions that will resolve current deficiencies and meet future aspirations of the network.

The NOF identified that changes are needed to encourage walking, cycling and public transport and discourage general traffic along Salisbury Road during the AM and PM peaks. This was due to Salisbury Road becoming a rat-run for vehicles to avoid queuing on State Highway 6 and in consideration of the 6 Schools on Salisbury Road

Whilst the intersection wasn't identified as an intervention in the NOF, it was obvious that the intersection could be used to contribute to these objectives. An underpass may encourage walking and cycling, but the double lane roundabout would encourage more traffic along Salisbury Road.

The roundabout needed to act as a gateway providing visual clues that general traffic was entering an area where vehicles don't have priority. At-grade priority crossings on raised tables require vehicles to slow down and give way to pedestrians and cyclists. Similar zebra crossings are repeated at key locations on Salisbury Road and Champion Road in front of schools. The

roundabout needed raised priority crossings not only for safety at the crossing but as a kind of threshold treatment, indicating a change from a high speed vehicle priority area to a residential school zone.

### **Consultation**

Council had previously consulted the public through the Long Term Plan process on the preferred option of a double lane roundabout with a walking and cycling underpass. Several newspaper articles meant that the wider community has an expectation of what they were going to get.

Council undertook revised consultation with a targeted group of affected parties including adjacent landowners, the local schools (7 in total), and groups representing different aspects of transport (biking, AA, local businesses). The groups were provided the business case shortlisted options, including the now preferred option of an at-grade walking and cycling facility. The groups had the opportunity to have a one-on-one conversation with Council staff to discuss the reasons around the change of the preferred option.

Most of the affected parties initially still wanted the underpass, as it appeared to be safer for pedestrians and didn't hold up traffic. However, the raised zebra crossings gained support when the reasons for the changes were explained, as long as there was still an option to put an underpass in later.

### **New Solution**

Council staff presented the revised option of changing the design from an underpass to raised crossings (as shown in Figure 4) to Council in a report. Despite, reducing the overall project budget by \$3M, some Councillors were reluctant to give up the underpass and were prepared to spend the extra finance in order to provide an underpass. This was despite the business case no longer supporting the underpass option meaning Council would no longer get funding assistance from Waka Kotahi and would have to pick up a larger portion of the cost.

After a long discussion, councillors agreed with staff and resolved to support the change to raised crossings, as long as the design did not prevent an underpass from being built in the future.

Council staff wanted the crossings to be as close to the roundabout as possible to limit deviation from walking and cycling desire lines, but Council also needed the double lane approaches to the roundabout between the zebra crossing and the limit lines. The location of the entrances to the supermarket and position of queuing traffic to turn influenced the final placement of the crossings. The final solution included the crossing set back from the roundabout by two car lengths. This is different from the usual one car length used in Dutch roundabouts.



Figure 4: Visualisation of the preferred solution

## Outcomes

The roundabout was completed in May 2021, six weeks ahead of schedule. Traffic monitoring has been compared to the modelling. The modelling was correct, there is a reduction in traffic delays. Where traffic queuing has taken longer to clear, the cause is due to be capacity issues on Salisbury Road itself, not the roundabout. When Salisbury Road was clear, any queuing formed from pedestrians and cyclists using the crossing cleared quickly.

Cycling counting will be undertaken in February 2022 to compare with previous years. Until then, the increase in walking and cycling is unknown. What is known is the increased satisfaction from pedestrians and cyclist that commonly use the intersection. Many expressed their gratitude in removing a significant safety risk and are much more satisfied with the roundabout.

Many are now allowing their children to cycle through this intersection using the shared paths and crossings, whereas prior to the upgrade they made sure their children found alternative, and out of the way, routes which avoided the intersection.

Post construction safety audits identified queuing obstructing visibility of the table crossings as one of the significant risks. Council measured speed existing the roundabout and approaching the raised crossings and found the 85<sup>th</sup> percentile approach speeds were 27.9km/h and 25.0km/h on Salisbury Road and Champion Road respectively. Overall, Council is satisfied that the speeds are aligned with Safe System principles for car vs. car collisions and car vs. pedestrian collisions at these locations. Council has also made some minor changes to illuminate the pedestrian and cycle approaches to the intersection, so vehicles more easily spot cyclists at night.

Public response to the upgrade has been mixed. Some motorists are concerned that drivers will not give way to pedestrians or cyclists and others are concerned that cyclists could 'appear out of nowhere in front of them.' However, many motorists applaud the changes and have likened it roundabout design in the Netherlands.





Figure 5: Aerial photo of the completed upgrade



Figure 6: View of the roundabout from the ground

## CONTINUATION Further Opportunities

Waka Kotahi have recently completed a similar roundabout design on SH60 in Motueka which is also within Tasman District. Like the Champion/Salisbury roundabout, this location also has



schools, recreational centres and shops which attach a higher use of active modes. Since this roundabout was only completed in December 2021, success of the changes is not yet known.

TDC and Waka Kotahi have just completed the Richmond Transport Programme Business Case (PBC). The outcomes are to improve infrastructure for walking, cycling and public transport in the short to medium term to encourage mode shift. The programme includes a number of road and intersection changes to provide for safe cycling, including three intersections on primary cycle routes. Council staff are considering a Dutch style roundabout in the light of the success at the new Champion/Salisbury roundabout. The design will have to take into account the space constraints of the existing intersections and may include combining the roundabout and protected intersection designs shown in Figure 7 and Figure 8 below from Auckland Transport's Urban Street and Road Design Guide.

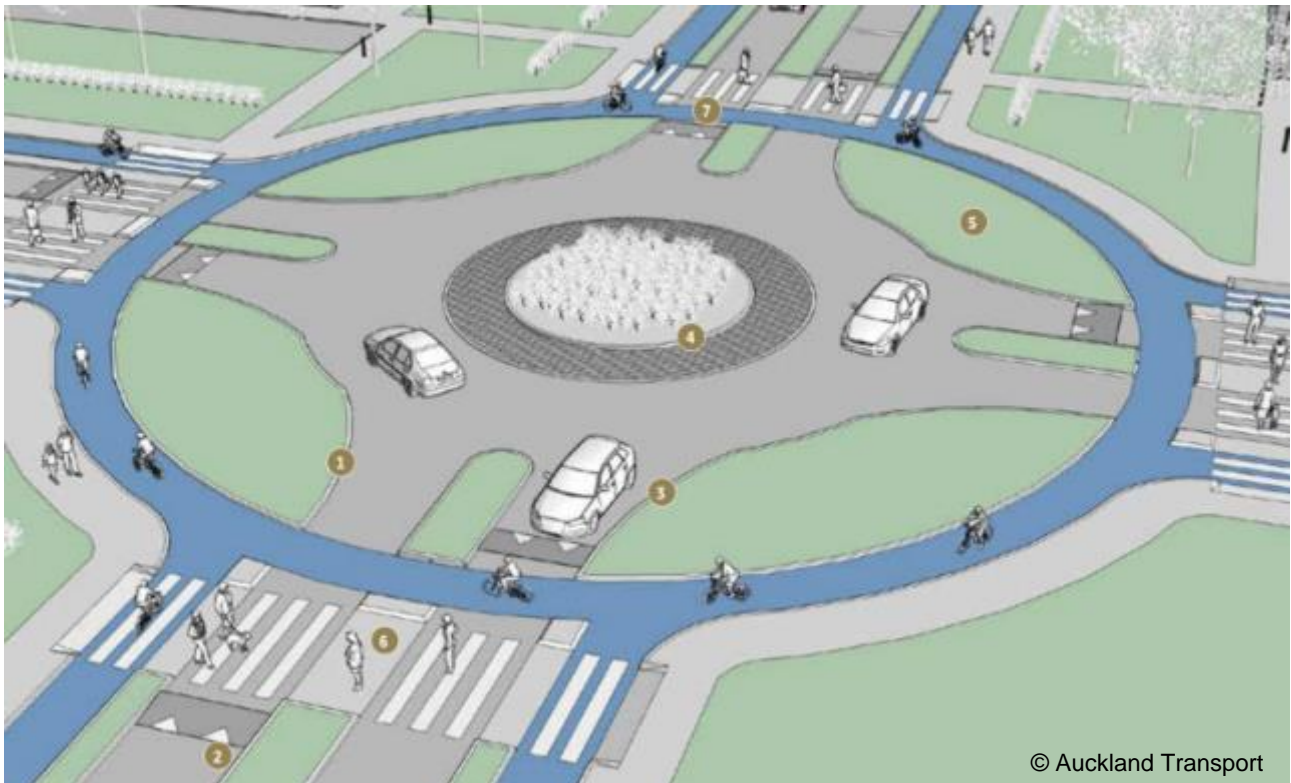


Figure 7: Suggested roundabout treatment



Figure 8: Suggested arterial road treatment



## CONCLUSIONS AND RECOMMENDATIONS

This project started off trying to cater for additional traffic generated by the new supermarket. Council identified the lack of walking and cycling infrastructure at this strategically important location. Councils' initial response to address this issue was an underpass however, through the development of the business case, Council was able to find a solution that not only provides a better level of service for all modes but cost significantly less.

The preferred option of an underpass was challenged, and solutions were identified that wouldn't normally have been considered due to concerns around safety and traffic delay. The new preferred option of raised zebra crossings was not well supported by the affected parties, but one on one conversations provided opportunities to discuss the issues and improve understanding. Councillors also shared the same concerns of safety and traffic delay. What helped allay these concerns was that Council preserved the ability of constructing an underpass in the future.

The Network Operating Framework (NOF) helped by establishing the roundabout changes into the wider transport context. It helped justify the need to prioritise walking and cycling on Salisbury Road starting at this intersection.

The project met both the objectives of catering for vehicle growth and making it safer for pedestrians and cyclists. Post construction audit and traffic monitoring has found that traffic using the roundabout is behaving as expected but there are some minor changes that can be made to further enhance safety.

Public reception to the completed project was initially negative, but after using the roundabout as vehicle drivers, cyclists and pedestrians, the responses are now largely neutral or positive. This improvement in public perception of such a high-profile roundabout provides confidence to Council staff to pursue similar 'Dutch' style roundabouts at other intersections.

The NOF and Richmond Transport Programme Business Case have identified another three intersections along the primary cycling route in Richmond. Council will look to use similar style roundabouts to provide for safe and enjoyable walking and cycling.

This style of roundabout is relatively new to New Zealand. This made it difficult explaining the concept to the community and Councillors. The idea of putting crossing points so close to the roundabout was unbelievable to most people. It is recommended that consultation on this type of roundabout is accompanied by video of some examples, so people can see how they work.

## REFERENCES

Urban Street and Road Design Guide (n.d.). *Auckland Transport*, viewed 26 November 2021, < <https://at.govt.nz/media/1980686/urban-street-and-road-design-guide.pdf>>

## ACKNOWLEDGMENTS

This project has been supported by a number of staff within Tasman District Council. It is worth mentioning a number of key people that made a significant contribution including, Mike Van Enter, Graham Rimmer and Jamie McPherson.

It should be acknowledged that there has been significant input from many staff at Waka Kotahi, in particular, Erik Teekman who challenged Council to look at different alternatives.

It should be acknowledged that Tasman District Councillors trusted staff recommendations and made a shift away from what the public were expecting. It was greatly appreciated.