

3. DEANS AVENUE/RICCARTON AVENUE/RICCARTON ROAD INTERSECTION

Officer responsible City Streets Manager	Author David Robinson, Transport Planning Engineer - DDI 941 8937
--	---

The purpose of this report is to inform the Council of:

- The performance of the roundabout at this intersection.
- The proposed redevelopment of the 'Nancy's Hotel' site on the southwest corner of the Deans Avenue/Riccarton Avenue/Riccarton Road intersection which provides a rare opportunity to purchase land to allow the intersection to be further upgraded in the future.
- That part of the intersection currently occupies land that is still part of the 'Nancy's Hotel' site land title.

and seek its support for:

- The future signalisation of the intersection.
- For a pedestrian and cycle underpass to be built between North Hagley and South Hagley Park in association with the future signalisation.
- The Council to enter into negotiations to:
 - Purchase land that is currently occupied by the Council for roading purposes but is still held as part of the 'Nancy's Hotel' site land title.
 - Purchase the additional land that has become available with the proposed redevelopment which would be required to achieve the future signalisation of the intersection.
 - Purchase a small amount of additional land required for the future signalisation of the intersection from the land owners on the northwest corner of the intersection
- For consultation to proceed with affected parties on the matter of extending the existing median island on Riccarton Road westward to restrict right turns into and out of the redeveloped 'Nancy's Hotel' site.

CURRENT INTERSECTION PERFORMANCE

Safety

The Deans Avenue/Riccarton Avenue/Riccarton Road intersection is a major intersection on the inner ring route provided by the four avenues (Deans Avenue, Moorhouse Avenue, Fitzgerald Avenue, Bealey Avenue/Harper Avenue) around the central city. This ring route is part Christchurch's Strategic Road Network as defined by the Regional Land Transport Strategy 2002 - 2007 (RLTS) and it is therefore important that an adequate level of service in terms of safety and travel times is provided.

The intersection has had a poor safety record in the past. In the five years from January 1997 to December 2001, 110 crashes were recorded at the intersection, ranking it 8th worst in Christchurch based on the social cost of crashes.

In May 2001, the existing roundabout layout underwent significant changes to improve safety and reduce the crash rate at the intersection. The central island diameter was nearly doubled and some of the approaches realigned to increase the deflection of the path followed by vehicles travelling through the intersection.

Beca Consultants were recently employed by the City Streets Unit to undertake a crash analysis of the performance of the roundabout. The main findings of their report were that:

- In the five years prior to the changes to the roundabout in 2001 the reported injury crash rate was 5.40 injury crashes per year
- In the two years subsequent to the changes the reported injury crash rate was 2.50 injury crashes per year, or a 54% reduction
- The annual number of actual reported injury crashes remains significantly above the expected number of annual injury crashes, by 39%, for a typical roundabout with the same traffic volumes.

The most likely reasons that the crash rate remains well above that which could be expected are that:

- The roundabout layout is geometrically constrained by Hagley Park on the eastern side and development on the western side. This means that the roundabout does not meet full geometric design standards. For example, the central island diameter at 20m is still 4m short of the minimum design standard. This reduces the distance between an approach and vehicles circulating on the roundabout or entering from the upstream approach making it more difficult for drivers to judge acceptable gaps in the traffic.
- The roundabout remains a difficult environment for pedestrians who are required to cross with mainly multilane approaches and with no priority given to their movement.
- Cycle facilities provided on some approaches at the intersection do not meet full design standards.

Traffic Capacity

The RLTS sets out level of service requirements for the strategic road network. During peak periods the level of service (LOS) is recommended to be D or better (LOS A to LOS D) corresponding to an average maximum delay of 55 seconds per vehicle at an intersection.

In terms of traffic capacity, the existing roundabout often operates near, at or above capacity (LOS F), during parts of the peak hour periods. Long queues mainly occur on the southern Deans Avenue approach during the evening peak, but can occur on other approaches during either peak period.

Also peak traffic queues from the Deans Avenue/Kilmarnock Street intersection can extend back as far as the roundabout, influencing its operation by preventing northbound vehicles from entering the intersection as there is not sufficient room on the departure side. Over the whole evening peak hour the average level of service is D.

Based on traffic modelling work undertaken for the Blenheim Road deviation, traffic flows through the intersection are expected to continue to increase by around 1.27% per year or 25% over the next 20 years. This is comparable to the historic growth rate on Riccarton Road and Riccarton Avenue.

With the continued traffic growth, the intersection is forecast to be operating well above capacity, or LOS F, by 2021.

PROPOSED REDEVELOPMENT OF 'NANCY'S HOTEL'

The City Streets Unit became aware of the potential redevelopment of the 'Nancy's Hotel' site on the southwest corner of the intersection in late 2002.

Positive discussions were held between City Streets Unit staff and the land owners consultants to see if it was possible for the Council to negotiate purchase of part of the site to allow for future improvements to the intersection.

Building developments, in general, have an economic life of the order of 50 to 100 years. Thus the redevelopment of 'Nancy's Hotel' potentially provides a once in a lifetime opportunity to acquire additional land to allow for future improvements to the intersection without impacting on a developed use of the site.

FUTURE INTERSECTION IMPROVEMENTS

Improvement Options

City Streets unit investigated three improvement schemes for the intersection:

- Further modifications to the existing roundabout so that it would meet full design standards:
 - ▶ It was found that it was impossible to fit a roundabout of full design standard at the intersection without requiring both land from Hagley Park and the majority of the 'Nancy's Hotel' site. Because of this, the option was not considered further.

- Traffic signals with slip lanes on all approaches:
 - ▶ This option is the technically preferred option as it reduces the crossing distance for pedestrians and provides the most capacity at the intersection. This option was put to the 'Nancy's Hotel' site land owners for consideration, but was rejected because the slip lane from Deans Avenue to Riccarton Road required too much of the site.
- Traffic signals with slip lanes on all approaches except Deans Avenue south approach:
 - ▶ This option provides less capacity at the intersection than the option above. However, the left turn volumes from Deans Avenue south into Riccarton Road are low enough that a combined left-through lane is possible, similar to that at the current roundabout. This option was put to the 'Nancy's Hotel' land owners for consideration and was accepted in principle.

Safety Benefits

Beca Consultants in their report estimated an improvement in the crash rate converting the existing roundabout to traffic signals. Based on crash prediction models, the reported injury crash rate of 2.50 crashes per year is predicted to drop to between 1.6 to 1.1 crashes per year, a 36% to 56% drop in the crash rate with the installation of traffic signals.

The introduction of traffic signals also allows signalised pedestrian crossing facilities at the intersection as well as the ability to provide cycle lanes that meet the required design standards.

Travel Time Benefits

The introduction of traffic signals at the intersection would provide about the same peak traffic capacity as the current roundabout does for existing traffic volumes. Average travel delays in the morning and afternoon peak would be similar to those currently experienced at the roundabout reflecting the similar intersection capacities. Average travel delays in the inter peak period would be higher because of the number of traffic phases required to accommodate the turning movements.

Average Traffic Delays - Seconds Per Vehicle And Level Of Service (A - F)				
Time Period	Current Traffic Volumes		2021 Traffic Volumes With Blenheim Road Deviation	
	Roundabout	Traffic Signals	Roundabout	Traffic Signals
Am Peak Hour	34 - C	37 - D	183 - F	82 - F
Inter Peak	18 - B	30 - C	115 - F	50 - D
Pm Peak	46 - D	39 - D	251 - F	61 - E
Note: For LOS F, traffic volume/intersection capacity > 1.00 and the average delay per vehicle > 80 seconds				

However, the benefit of the traffic signals is the additional capacity they provide into the future as traffic flows continue to increase. While the level of service provided by the roundabout is predicted to deteriorate significantly, the level of service would deteriorate much more slowly with the introduction of traffic signals. This reflects the inability of the roundabout to allocate movement priority proportional to demand. If a reasonable level of service is to be maintained at the intersection it would be preferable for the traffic signals to be installed within approximately seven years.

Issues and Disbenefits

The installation of traffic signals at this intersection does raise some issues and provides some disbenefits as well. These are discussed below. A scheme of the traffic signal layout close to the actual intersection is included as attachment 1, with the full extent of the scheme shown in attachment 2.

Hagley Park constrains the overall design of the signalised intersection:

- To cater for the traffic volumes and turning movements at the intersection it is necessary to provide four approach lanes on Riccarton Avenue, two right turning lanes and two through lanes, as well as a left turn slip lane. There are also two departure lanes towards the City. Because of this, it is not possible to provide a median traffic island for the numerous runners, cyclists and walkers travelling between North and South Hagley Parks. It is therefore recommended that if the Council proceeds with the traffic signals at some stage in the future that a pedestrian and cyclist underpass across Riccarton Avenue between the parks be considered to cater for this demand. The signalised crossing would still be available for those not wishing to use the underpass. There are potentially legislative, as well as design issues that would need to be addressed if an underpass was constructed. The Parks and Waterways Planner has agreed in principle that the concept should be considered in more detail if the intersection signalisation is supported. It is worth noting that an underpass between North Hagley and Little Hagley Parks is also being considered for inclusion in the improvement options for the Bealey Avenue/Carlton Mill Road/Harper Avenue/Park Terrace intersection.
- The left turn slip lane from Riccarton Avenue into Deans Avenue is shorter, and the adjoining pedestrian island smaller than desired. If the pedestrian and cycle underpass between North and South Hagley Park is not constructed, it may be necessary to exclude the slip lane and island from the design as the island is likely to be too small to cater for the number of pedestrians and cyclists crossing between the parks. This would mean the leftmost lane would revert to a left and through lane. This would have a downside safety risk by allowing vehicles turning left from Riccarton Avenue into Deans Avenue at the intersection to cross cyclists travelling straight through to Riccarton Road in the cycle lane. An alternative would be to undertake a land swap of road reserve and Hagley Park land to provide an island and slip lane to full design standard. However, this would require an Act of Parliament to approve the changes. Such changes could be considered at the same time that Council considers similar issues with respect to improvements of the Bealey Avenue/Carlton Mill Road/Harper Avenue/Park Terrace intersection.
- Deans Avenue is only 20m wide but has to cater for four traffic lanes to the north, and three lanes to the south of the intersection. Installation of traffic signals requires an additional lane on the northern and southern approaches to cater for right turns. If the northern approach lane is to cater for 95th percentile queues and current traffic demand about 100m of the median on Deans Avenue would have to be removed to just short of Ayr Street. This would also require the relocation of the lighting poles. On the southern approach the existing 40m of median island north of Bartlett Street would need to be removed to cater for a right turn lane.
- It is not possible to provide a southbound cycle lane on Deans Avenue, nor is there one provided with the existing roundabout. Because of this, almost all southbound cyclists are using North Hagley Park and then crossing Riccarton Avenue into South Hagley Park. Forty-two cyclists and 28 pedestrians were observed making this crossing during the morning peak hour.

The Blenheim Road deviation will place additional pressure on the traffic signals, as it will to the existing roundabout, by increasing what is already a high number of right turns from Deans Avenue north heading west into Riccarton Road. This will cause some spill back problems with vehicles queuing in the through lane to turn right and therefore decreasing the potential intersection capacity should traffic signals be installed.

Due to the number of approach and departure lanes required to make the traffic signals function adequately a number of parking spaces would be lost with the installation of traffic signals at the intersection. There would be 14 spaces lost from the western end of Riccarton Avenue and three spaces lost from the southern Deans Avenue approach as shown in attachment 2. On Riccarton Road there would be 13 spaces lost as shown in attachment 4 compared to the parking available should the Riccarton Road (Mandeville to Deans) project proceed as indicated in attachment 5. The loss of parking spaces is not inconsistent with policy '4U' of the Council's Parking Strategy, which ranks safety, traffic flow, pedestrian/cycle facilities and landscaping above provision of parking on arterial roads. However, the effects on adjoining property owners would need to be considered during consultation should Council proceed with the signalisation in the future.

As indicated in attachment 1 a small amount of additional land, 64m², from the property on the northwest corner of the intersection will be required if the intersection is to be signalised in the future. The property owner has recently been informed of the Council's potential desire to negotiate purchase of this area of land.

Overall Benefits

For construction commencing in 2006 the benefit/cost ratio of the project is estimated to be 5.9 but excludes any benefits to pedestrians and cyclists travelling between North and South Hagley Parks. This includes \$1.5m in land and construction costs at the intersection and an additional \$0.96m for the construction of the cycle and pedestrian underpass between North and South Hagley Park. Without the underpass the benefit/cost ratio is 9.7. Given the level of the benefit/cost ratio and the consistency of this project with the RLTS level of service requirements, it is likely to receive a Transfund New Zealand subsidy. (Note: The benefit/cost analysis is subject to peer review and acceptance by Transfund New Zealand).

LAND OCCUPIED BY COUNCIL FOR ROADING PURPOSES BUT STILL IN PRIVATE OWNERSHIP

For the traffic signals to be able to be constructed at the intersection at some time in the future, 259m² in total of the 'Nancy's Hotel' site land title is required. The Survey Team Leader has advised that the Council is already occupying 102m² of the 259m² for roading purposes. This area is indicated in attachment 3.

The Survey Team Leader comments:

"A considerable portion of the land (102m²) required from the Nancy's Hotel site, Pt RS 10 CT448/105, has been occupied as road for a long time, presumably the duration of the hotel. A Land Transfer plan, LT 34727, prepared in 1974 shows 66m² of CT448/105 to be vested in the CCC as Road. The plan was not proceeded with.

The City Council has an obligation to acquire such land if it desires to continue using the land as road. The land owners could fence off their title if they really wanted to. The 1974 plan appears to have been a tidy up exercise initiated by the owners at the time and the value of the land to be vested as road may not have been great. I would assume that the value of the land now would be considered in terms of a proposed development, ie much greater than a piece of land that, in 1974, wasn't occupied or required by the owner.

The land could be acquired by Proclamation under the Public Works Act or vested in the City Council on subdivision. Either procedure would require a negotiated price."

CONSULTATION

This report has not yet been tabled with the relevant community boards as it is important that the proposed future improvements first have the Council's support. The report will subsequently be presented to the Riccarton/Wigram and the Hagley/Ferrymead Community Boards for information as the intersection lies on their boundary.

No public consultation regarding the proposal has been undertaken to date. This would only be necessary if and when Council commits the project to its capital programme. Public input would be available through the Long Term Council Community Plan submission process and specific project consultation.

'NANCY'S HOTEL' REDEVELOPMENT - PROPOSED MEDIAN EXTENSION ON RICcarton ROAD

A resource consent application for the redevelopment of 'Nancy's Hotel' has been received by the Council. The application proposes to retain a vehicle crossing on Riccarton Road. Alternative access to the site is also proposed from Bartlett Street.

City Streets and Environmental Services Units staff are recommending that if the redevelopment proceeds the Riccarton Road vehicle crossing be restricted to left in - left out, for safety reasons and would be a condition of the resource consent.

The most effective way to achieve the left in - left out, only restriction is to extend the existing median island westwards which also has the advantage of keeping the vehicle crossing width to a minimum for two-way flow. This is consistent with the approach taken at other two lane arterial roads near an intersection where there are vehicle driveways close to the intersection and high traffic flows on the road. Examples include Shirley Road at it's intersection with Marshland Road and Ferry Road west of it's intersection with Aldwins Road. The median extension would also affect right turn access to Hunter Furniture on the north side of Riccarton Road.

To achieve the median extension the kerblines on the southern side of Riccarton Road outside the 'Nancy's Hotel' site needs to be moved. However, as a consequence three parking spaces from outside numbers 11 and 13 Riccarton Road would be lost, compared to the scheme Council is proposing to consult on shown in attachment 5.

While the onus is usually on the resource consent applicant to undertake consultation with parties affected by the median, it would be appropriate, given the extent of changes proposed, that City Streets Unit undertake the consultation jointly with the applicant and report back to the Sustainable Transport and Utilities Committee for a decision.

Given that the kerblines are required to be moved to allow for the median extension, the full cost of the associated on-road works can be sought from the resource consent applicant. The estimated cost of the median extension is \$11,200 and the kerb work on the south side of Riccarton Road, \$65,000.

If the Council agrees with the median extension proceeding to consultation then it would be useful to amend the Riccarton Road (Mandeville Street to Deans Avenue) consultation scheme to include the median extension, otherwise some confusion may arise.

Should the Council decline the median extension option now or after consultation, the applicant will be required to find alternative methods of providing safe vehicle movements to or from Riccarton Road.

BUDGET

A total of \$225,000 is allocated for property purchase at the Deans Avenue/Riccarton Avenue/Riccarton Road intersection in the current annual plan.

The Property Unit has estimated that approximately \$370,000 is required to complete purchase of the 102m², 157m² and 64m² land parcels.

A reallocation of approximately \$145,000 of funding into the 2004/05 financial year from the Road Network Improvements category years 2 to 5, will be necessary at the next budget round if the property purchase is to be completed in the 2004/05 financial year.

The capital cost of the intersection signalisation and underpass construction is \$2.1m. This amount will need to be introduced to the capital works programme by the Council, if and when it decides to proceed with this project. At this stage it is suggested that the funding is provided in the new years 5 and 6, subject to a more detailed prioritisation process through the Metropolitan Christchurch Transport Statement.

CONCLUSION

The Council is already occupying private land for roading purposes on the southwest corner of the Deans Avenue/Riccarton Avenue/Riccarton Road intersection which it is obliged to purchase if it wishes to continue to occupy it.

The redevelopment of the 'Nancy's Hotel' site provides a rare opportunity to purchase some additional land to allow for future improvements to one of Christchurch's major intersections.

A small area of land from the site on the northwest corner of the intersection is additionally required if the future improvements at the intersection are to occur.

The above land will allow the future signalisation of the intersection which will be beneficial to vehicle drivers in terms of safety and efficiency, as well as beneficial to cyclists and pedestrians using the intersection. However, there are also some issues and disbenefits associated with the constraints imposed by Hagley Park, and the number of approach and departure lanes required to make the intersection perform adequately.

The inclusion of a grade separated pedestrian and cyclist crossing of Riccarton Avenue for Hagley Park users would potentially enhance future intersection improvements.

The proposed redevelopment of the "Nancy's Hotel' site would require the vehicle crossing on Riccarton Road be restricted to 'left in/left out' only for safety reasons. A scheme extending the existing median island westward is proposed for consultation purposes.

The Council has money budgeted for the land purchase but has not yet committed funds in its capital works programme for the future intersection improvements. It would be appropriate to prioritise this project in the capital works programme as part of the Metropolitan Christchurch Transport Statement process.

- Recommendation:**
1. That the Council support the early future signalisation of the intersection, including the construction of a pedestrian and cycle underpass between North and South Hagley Parks.
 2. That the consultation proposal shown in attachment 5 be amended to include the changes as shown in attachment 6.
 3. That the Property Manager be authorised to commence negotiations for land purchase as detailed in the report.
 4. That any required budget adjustments for property purchase be reported back to the Committee through the budget process or as necessary.