

6. BREENS/GARDINERS/HAREWOOD INTERSECTION - SAFETY IMPROVEMENT PROJECT

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PURPOSE OF REPORT

1. The purpose of this report is to update the Board on the Breens/Gardiners/Harewood Intersection project. This project was initiated by a survey done at Breens Intermediate School as part of a School Cycle Bubble project.

EXECUTIVE SUMMARY

2. The principal aim of the School Bubble Cycle project is to investigate, and where possible, implement improvements to road safety for school children cycling to and from school. The Breens/Harewood/Gardiners intersection was the area identified by most student cyclists as intimidating.
3. The options identified to date are:
 - Option 1: Maintenance of the status quo.
 - Option 2: Reduction of through lanes on Harewood Road from two to one.
 - Option 3: The installation of kerb build-outs and reduction in kerb radii at the intersection.
 - Option 4: Installation of traffic signals at the intersection (cost estimate \$422,000).
4. At its 26 August 2006 meeting the Fendalton/Waimairi Works, Traffic and Environment Committee received a report that provided an update on the Breens Intermediate Cycle Bubble project, which included the consultation history and the options identified so far. This information was for information only and no preferred option was identified. There was also reference to a submission from one resident who sought some form of protection for his property following an incident where a vehicle crashed through his fence.
5. The Committee supported Option 4 (Traffic Signals) and requested a report back on ways to fund this option. The Committee also supported the installation of suitable safety measures outside 395 Harewood Road and requested staff to work with the resident to obtain a suitable safety measure.
6. The current budget allocation of \$102,000 would need to be supplemented to allow this project to proceed. Other sources of funding were therefore investigated and are discussed in this report. The outcome is that Option 4 is not necessarily the preferred option and cannot be currently funded. It is recommended that the project be deferred to 2007/2008 when more investigations can be completed to provide solutions and certainty can be achieved as to the funding for this project.
7. There are two options offered with respect to the safety measures requested at 395 Harewood Road. The staff recommendation is to do nothing as they believe there is no need for the measures and that any measures installed will set a precedent in the City. The alternative option is to install a crash barrier against the Breens Road boundary at an estimated cost of \$8,000.

FINANCIAL AND LEGAL CONSIDERATIONS

8. The estimated total cost for Option 4 (Traffic Signals) is \$422,000, inclusive of all consultation, design, and project management. The 2006/2007 Capital Programme budget for the Breen's Cycle Bubble is \$102,000. It is recommended that the project be deferred due to the lack of available funding.
9. The cost to install the safety barrier at 395 Harewood Road is \$8,000. There is no budget for this installation as this project would not reach the prioritisation threshold for funding from the Safety Improvements or Neighbourhood Improvements budget. Also it can not be funded from the 'cycle bubble project' as it does not contribute to achieving the project objectives. As there is no other funding source, if the Board wishes to pursue this option, it is recommended that it be funded from the Board's discretionary funding.

STAFF RECOMMENDATION

It is recommended that the Board support the do-nothing option for safety measures at 395 Harewood Road.

BACKGROUND ON BREENS/GARDINERS/HAREWOOD INTERSECTION PROJECT

10. At its 26 August 2006 meeting, the Fendalton/Waimairi Works, Traffic and Environment Committee received a report that provided an update on the Breens Intermediate Cycle Bubble project. This included the consultation history and the options so far identified. There was also reference to a submission from one resident who seeks some form of protection for his property following an incident where a vehicle crashed through his fence.
11. The Committee made the following recommendations, which were adopted by the Community Board on 12 September 2006:
 1. *That the information be received.*
 2. *The Committee supports Option 4 (Installation of traffic signals at the intersection) and requested a report back on ways of funding this option.*
 3. *The Committee also supports the installation of suitable safety measures outside 395 Harewood Road and that staff work with the residents in obtaining a suitable safety measure.*
12. This report aims to address resolutions 2 and 3.

Resolution 2 - Cycle Bubble Project Options

13. As detailed in the August 2006 report, the project was initiated through the Breens Intermediate Cycle Bubble project in which the aim of the project was to investigate, and where possible, implement improvements to road safety for school children cycling to and from school. Results from the Breens Intermediate Cycle Bubble survey have identified several areas that student cyclists find intimidating. The Breens/Harewood/Gardiners intersection was the most common area so identified. 167 (out of 200) surveys were completed, 92 students indicated that they cycle to school and another 22 indicated that if they could choose to cycle to school they would.
14. Following the school's involvement and the feedback from the surrounding community the following objectives were formed for the Breens/Harewood/Gardiners intersection:
 - Improve safety for pedestrians and cyclists
 - Decrease vehicle speeds
 - Create an environment which encourages drivers to comply with the stop signs at Breens and Gardiners roads
 - Minimise congestion associated with children being dropped off and picked up from school
15. Four options have been identified to date and are described below. A roundabout was not considered suitable for this location as it would be required to be of a very large radius and multi-laned; this would not enhance cyclist and pedestrian safety and may in fact worsen the situation. This option may also involve property purchase.

Option 1: Maintenance of the status quo.

16. Retention of the existing uncontrolled intersection.

Option 2: Reduction of through lanes on Harewood Road from two to one.

17. This option reduces the number of through lanes from two to one on Harewood Road, through the painting of chevron marking alongside the median island to increase the width of non-trafficked area. It is also proposed to have chevron marking installed between the right turn lane and through lane to increase the storage area provided in the centre of the intersection.
18. Relocating the existing pedestrian refuges on Breens and Gardiners Road closer to the intersection is proposed as well as marking cycle lanes on Harewood Road. It is proposed to reduce the kerb radii on the southeast side of the intersection and to place no stopping lines around all quadrants of the intersection.

Option 3: The installation of kerb build outs and reduction in kerb radii at the intersection.

19. This option involves the installation of kerb build-outs and a reduction in kerb radii at the intersection. The two through lanes and a right turn lane on Harewood Road will be retained. It is proposed to widen the existing central median island adjacent to the right turn lanes onto Harewood Road to allow the pedestrian island to be relocated closer to the intersection. Cycle lanes will be marked on the approach and departure of each leg of the intersection on Harewood Road.

Option 4: Installation of traffic signals at the intersection.

20. This option retains two through lanes and right turn lanes on Harewood Road and with road widening could also provide for a separate left turn lane. The Breens and Gardiners Roads approaches would be modified to provide an exclusive, opposing right turn lane and a shared through and left turning lane. The pedestrian islands on both Breens and Gardiners Roads would need to be removed.
21. The central median island adjacent to the Harewood Road right turn lanes will have to be widened to accommodate the traffic signal poles, while the central median away from the intersection will be reduced in width to accommodate the additional traffic lane and cycle lane.
22. Kerb build-outs and reduced kerb radii will be provided on all quadrants of the intersection. It is proposed to mark cycle lanes on all approaches to the intersection. No stopping will be marked around all quadrants of the intersection and outside the kerb build-outs.

DISCUSSION OF OPTIONS

23. Option 1- The option to maintain the status quo essentially means to do no capital works at this intersection. This would retain the road environment in its existing condition. However, this option continues to be considered as a solution if the alternative options can not meet the project objectives and budget.
24. Option 2 does not meet all of the project objectives. Although it increases the safety for pedestrians and cyclists and decreases vehicle speeds, this option does not increase compliance with Stop controls on Breens Road and Gardiner Road. It also does not minimise congestion associated with school drop offs and picks up.
25. Option 3 does not meet all of the project objectives. Although it increases the safety for pedestrians and cyclists, decreases vehicles speeds and minimises congestion associated with school drop offs and pick ups; this option does not increase compliance with Stop controls on Breens Road and Gardiner Road.
26. Option 4 has the potential to improve the safety of pedestrians and cyclists more than Option 3 would but also has the potential to create problems with turning vehicles conflicting with parallel crossing pedestrians. The signalisation would cost approximately \$422,000 against a cycleway budget of \$102,000. The option may also delay through traffic on Harewood Road and potentially encourage more traffic on the Gardiners/Breens route to and from Johns Road. The effect of this on the surrounding network is being quantified. On street parking will be reduced and noise in the vicinity increased due to acceleration and deceleration of vehicles.

Discussion on Option 4 (Traffic Signals)

27. As indicated in the previous report, there was no preferred option recommended as the impact of traffic signals (Option 4) had not been fully assessed. The following is a discussion on the investigations that have occurred since the August 2006 meeting.
28. The latest data from the Land Transport New Zealand Crash Analysis System shows there have been a total of seven reported accidents in the five-year period between 2001 and 2006 within a 50m radius of the Breens/Gardiners/Harewood intersection. One of these crashes was minor injury and the other six were non-injury crashes. None of the crashes involved cyclists or pedestrians. This supports the 2002 Beca report that accidents are reducing at this intersection as it is likely that all road users including cyclists and pedestrians have become more watchful when entering the intersection in response to the risk they perceive with the intersection.

29. A traffic model simulation of the surrounding network, including signals at this intersection, has been undertaken. This analysis shows that there are significant traffic volume increases expected on Breens Road (particularly heading north), but also a reasonable decrease (in the order of 25%) anticipated on Harewood Road. Wairakei Road and Sawyers Arms Road become more attractive (northwest - southeast) routes by installing the signals, caused by the increased average travel times on Harewood Road. Little overall change is expected on Gardiners Road, but this could change significantly if signals were also installed at the Gardiners Road/Sawyers Arms intersection. Signalisation of this intersection is also being investigated.
30. As this project is a Cycleway Project, it could be assumed that the Cycleway budget should cover the entire project costs, particularly as it does not rate as a priority issue in other budget categories. To fund this option entirely from the Cycleway budget would require the substitution out of many other important cycleway projects on the programme that require the funding more urgently. The current allocation of \$102,000 would need to be supplemented to allow this project to proceed. Other sources of funding were therefore investigated and are discussed below.
31. As discussed in the August 2006 report, at present signalisation of the Breens/Harewood/Gardiners intersection ranks lower (and below the priority threshold) compared to other City projects in terms of safety. The project was entered into the 'Safety Decision Making System' used for selecting which projects are progressed, and the resulting score was 0.596 out of a total possible score of 1. The number of projects scoring higher than 0.596 indicate that the Safety Improvements budget can not fund this project within the next five years.
32. Funding from the Roothing Network Improvements is in the same situation where there are other projects that are in more need of the funding, particularly now that the Council has committed itself to an additional \$20-30M of projects to support the Southern Motorway package, which are being introduced to the programme through substitution of existing projects.
33. In terms of external funding, an application for Land Transport New Zealand (LTNZ) funding would be appropriate for this project as the Benefit to Cost Ratio (BCR) for signalisation is 3.8. However, the First Year Rate of Return (FYRR) for the project is -20%, which means that any benefits associated with the project in the 2007/2008 financial year are outweighed by the project costs. The FYRR does not become positive until the 2011/2012 financial year. This typically results in LTNZ placing a lower priority on funding for this project. Projects can not be funded purely from LTNZ funding, as their subsidy rate would still require the Council to provide about the remainder of the funding.
34. Whilst it is recognised that this intersection has a number of issues that need addressing, investigations to date have not yet reached a positive conclusion. In the light that there does not appear to be a significant safety problem, it is recommended that the project be deferred until 2007/2008 when more investigations can be completed to provide solutions and certainty can be achieved as to the funding for this project.

Resolution 3 - Safety measures at the corner of Harewood Road Breens Road

35. A resident at 395 Harewood Road (on the corner of Breens Road) has expressed concern over the safety of their property and pedestrians in the vicinity following an accident in 2004 that destroyed the Breens Road boundary fence. The vehicle was travelling from Gardiners Road across the Harewood Road intersection and lost control on entering Breens Road, went off the road and hit the brick fence. As vehicles on Harewood Road are generally travelling faster than 60km/hr, the vehicles accelerate to cross the intersection increasing the chance of losing control. The fence was knocked over and ended up in the yard of 395 Harewood Road.
36. The resident is now concerned that this may occur again and cause injury to people that may be in the front yard. He has requested that the Council install some form of safety barrier. Council staff have, for many years, declined this request as they believe that one accident does not constitute the need for any safety measures. However, the Board has resolved that staff look into options that will address the resident's concern.
37. Staff met with the resident after the August 2006 meeting to discuss his issues and hear more about the accident in 2004. This meeting established the location that the resident is concerned about.

38. When there is a problem or a potential issue with errant vehicles hitting roadside objects Land Transport New Zealand recommend the following approach (refer to RTS 11–Urban Roadside Barriers and Alternative Treatments), which involves considering a number of alternatives as follows:
- Improve the road environment to reduce the likelihood of conflict (limited opportunity for this, even traffic signals would not reduce the risk of errant vehicles). The road surface will be investigated as friction may be a factor.
 - Remove the object so that it no longer requires shielding (not an option in this situation).
 - Leave the object unshielded (Option 1).
 - Install protection such as a barrier (in all situations a traffic barrier should only be installed if it reduces the severity of potential crashes) (Option 2).
39. Having given consideration to the approach above the following options have emerged. Bollards are required to be frangible in the road environment (i.e. collapse on impact) therefore this solution would not provide the protection intended. Bollards are sometimes installed in locations where the aim is to deter traffic taking short cuts through pedestrian areas, not where the concern is accident-related (accidents are unpredictable events). Therefore bollards have not been considered for this location.
- Option 1 – Do nothing** (i.e. no safety measures are installed at this location)
40. Installing any safety measures at this location for the specific purpose of protecting private property is not recommended.
- Option 2 - Crash Barrier**
41. A short length (i.e. 10 metres) of crash barrier is installed against the western boundary of the 395 Harewood Road (actually on the Breens Road frontage).

ASSESSMENT OF OPTIONS

- Option 1 – Do nothing** (i.e. no safety measures are installed at this location)
42. Installing any safety measures at this location for the specific purpose of protecting private property is not recommended. The reasons for this are:
- There has only been one accident. It is not a re-occurring problem, and the risk is considered very low.
 - Safety measures for this type of situation are not generally used in an urban, low-speed environment.
 - Any physical safety measure at this location to protect private property could set a precedent for other locations where vehicles have gone through fences, of which there are numerous examples in the City.
- Option 2 – Crash Barrier**
43. Longitudinal barriers function primarily by redirecting errant vehicles. To function correctly they should redirect and/or contain errant vehicles without subjecting the vehicle occupants to conditions more hazardous than collision with the unshielded object. Depending on its placement a roadside barrier may itself constitute a hazard. The recommended location for a crash barrier at this location is against the boundary so that it is not causing a hazard within the road reserve. For example, if the barrier was installed directly adjacent to the kerb it would potentially cause issues for cyclists if they fall from the bicycle.
44. The cost to install the barrier is estimated to be \$8,000. There is no budget for this installation as the project would not reach the threshold for funding from Safety Improvements or Neighbourhood Improvements budget. Also it can not be funded from the 'cycle bubble project' as it does not contribute to achieving the project objectives. If the Board choose this option, it is recommended that it is funded from the Board's discretionary funding.