

8. MOORHOUSE AVENUE/BARBADOES STREET INTERSECTION

General Manager responsible:	General Manager City Environment, DDI 941-8656
Officer responsible:	Manager Transport and Greenspace
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PURPOSE OF REPORT

1. The purpose of this report is to seek Board support and recommendation to the Council that the Moorhouse Avenue/Barbadoes Street intersection project proceed to implementation and for new traffic restrictions, associated with the Moorhouse Avenue/Barbadoes Street intersection project.

EXECUTIVE SUMMARY

2. This project was initially developed and progressed to consultation in conjunction with other intersection projects identified along Moorhouse Avenue. However, due to issues raised during consultation this intersection was removed from the Moorhouse cluster of projects, so that further options could be investigated without holding up the entire project.
3. The Moorhouse cluster includes Moorhouse Avenue from Barbadoes Street to Hagley Avenue and was supported by the Board in March 2006. However, the project did not gain approval from Council earlier this year. The Council has now indicated it is supportive of the project and if the Board supports this Moorhouse Avenue/Barbadoes Street intersection report it will be submitted to the Council in the New Year.
4. The study area relating to this report includes the Barbadoes Street/Waltham Road/Moorhouse Avenue intersection and the Barbadoes Street approach between Ferry Road and Moorhouse Avenue.
5. The project was initiated as a result of a crash reduction study undertaken in 2003, which identified the Moorhouse Avenue/Barbadoes Street intersection as an area requiring remedial safety work. Upgrading the intersection to improve safety also provided the Council with an opportunity to improve the cycle facilities and efficiency of the intersection.
6. Consultation has included two seminars with the Board in 2005, one-on-one consultation with major stakeholders and informative consultation with the surrounding community in January 2006.
7. There are three main community groups from which feedback has been received in regard to the Barbadoes Street proposal:
 - (a) **Barbadoes Street Cultural Zone Development Group**

This group has recently been developed (in response to this project) and would like to see the project put on hold until a longer term plan is developed by the Council for the area as a cultural zone, or, at the very least, that the current project is altered to support the area as a cultural zone rather than moving further away from the desired outcome for the area.
 - (b) **Cycling Advocates**

Twelve submissions were received in support of the proposal, in particular the improved cycling facilities, including eleven from individual cycling advocates and one from Spokes Canterbury Inc.
 - (c) **CPIT**

The CPIT is in support of the proposal and is keen to see the cycle facilities improve. However, it is also keen to see the area develop as a cultural zone, but understand this is outside the scope of this project and is a long term plan.
8. As a result of this feedback a number of additional options were investigated, three of which, including the status quo, are presented in this report.
9. The preferred option, Option B (**Attachment 1**), is similar to that presented in the publicity, except that the on-road cycleway on the western side terminates at Coventry Street and that an indentation on the eastern side is not required to accommodate parking. The recommended option includes:

- (a) Three lanes on Barbadoes Street at Ferry Road, one left/through lane, one through lane and one right turn lane, which diverges into two right turn lanes 80 metres before the junction.
 - (b) On-road cycle lanes along the eastern side of Barbadoes Street between Ferry Road and Moorhouse Avenue and on the western side between Ferry Road and Coventry Street.
 - (c) Changing an existing footpath to a 'shared use' path on the west side of Barbadoes Street between Moorhouse Avenue and Coventry Street.
 - (d) Twenty car parks, restricted to a maximum parking period of 120 minutes, are proposed along the eastern side of Barbadoes Street. Six car parks currently available on the eastern side will be lost as part of this proposal.
10. The preferred option will improve the safety and efficiency of the Moorhouse Avenue/ Barbadoes Street/Waltham Road intersection, decrease the queuing along Barbadoes Street and provide improved cycle facilities. Six car parks will need to be removed on the eastern side of Barbadoes Street; these car parks have been unable to be accommodated by other options while still achieving the project objectives.
11. The project team recognises that the project does not fulfil all the issues raised during consultation. However, the team is confident that the proposed option meets the aims and objectives of the project and is the best compromise between the views of the various stakeholder groups.

FINANCIAL AND LEGAL CONSIDERATIONS

12. The estimated total cost for the Moorhouse Avenue/Barbadoes Street intersection project is approximately \$137,000, inclusive of all consultation, design, construction and project management.
13. The Moorhouse Avenue project is part of the Safety Improvement Programme and Cycleway Programme and is programmed for construction in the 2006/2007 financial year. The combined budgets will allow funding for this project.
14. Without the approval of the resolutions for traffic restrictions, the restrictions will not be enforceable upon implementation.

STAFF RECOMMENDATIONS

That the Board support and recommend that the Council:

- (a) Approve the Moorhouse Avenue/Barbadoes Street intersection project to proceed to implementation (as detailed in **Attachment 1 (Option B)**).
- (b) Approve the following resolutions for new traffic restrictions associated with the Moorhouse Avenue/Barbadoes Street intersection project.

New No Stopping

- (i) That the stopping of vehicles be prohibited at any time on the east side of Barbadoes Street commencing at a point 87 metres north of its intersection with Moorhouse Avenue and extending 46 metres in a northerly direction.

New P120 Parking Restriction

- (ii) That the parking of vehicles be restricted to a maximum period of 120 minutes on the east side of Barbadoes Street commencing at a point 133 metres north of its intersection with Moorhouse Avenue and extending in a northerly direction for a distance of 55.5 metres.
- (iii) That the parking of vehicles be restricted to a maximum period of 120 minutes on the east side of Barbadoes Street commencing at a point 201.5 metres north of its intersection with Moorhouse Avenue and extending in a northerly direction for a distance of 73.5 metres.

CHAIRPERSON'S RECOMMENDATION

For discussion.

BACKGROUND

PROJECT INITIATION AND DEVELOPMENT

15. In 2003 the Council funded a Crash Reduction Study to identify, investigate and recommend remedial traffic engineering treatments at urban sites in the city that had a higher than average crash rate.
16. The study identified a number of intersections along Moorhouse Avenue as areas requiring remedial safety work, one of which was the Moorhouse Avenue/Barbadoes Street intersection. The study indicated that installing overhead signal mast arm poles would improve the visibility of the signals for motorists and result in a decrease in crashes.
17. Upgrading the intersection to improve safety also provided the Council with an opportunity to improve the cycle facilities and efficiency of the intersection.
18. This project was initially developed and progressed to consultation in conjunction with other intersection projects identified along Moorhouse Avenue ie the 'Moorhouse Avenue/Barbadoes Street Traffic Management & Safety Improvements' project. However, due to issues raised during consultation this intersection was removed from the overall Moorhouse Avenue project, so that further options could be investigated without holding up the entire project.
19. It should be noted that the proposed modifications on the Moorhouse Avenue and Waltham Road approaches to the Moorhouse Avenue/Barbadoes Street/Waltham Road intersection, including the build-outs, lane markings and cycle lanes were approved by the Board on 22 March 2006. This report is specifically in relation to the proposal for the Barbadoes Street approach to this intersection.
20. As mentioned above, the Moorhouse Avenue (Hagley Avenue to Barbadoes Street) section of the project was supported by the Board in March this year. It was also supported by the adjoining Spreydon/Heathcote Community Board. The report was forwarded to the Council on 6 April 2006 for final approval, however, the Council sought a seminar to allow more consideration of the project. This seminar was held on 2 May 2006 and a number of issues were raised primarily in relation to the appropriateness of cycle lanes on this arterial road and the desire to see more trees planted in Moorhouse Avenue. These issues have been investigated and will be reported on fully in the overall Moorhouse Avenue report that will be submitted to Council, including this section of the project, which requires Community Board support. A Council cycleway workshop held on 21 November 2006 showed that the Council was supportive of the project and willing to have the report re-submitted for consideration in the New Year.

DESCRIPTION OF SITE

21. The study area relating to this report includes the Barbadoes Street/Waltham Road/Moorhouse Avenue intersection and Barbadoes Street approach between Ferry Road and Moorhouse Avenue.
22. Moorhouse Avenue is a six-lane, median-divided arterial route and Barbadoes Street is a three-lane, one-way arterial route. In the morning and evening peak hours Barbadoes Street has a demand of 1,000 and 1,500 vehicles respectively.
23. The current layout of Barbadoes Street includes three lanes at Ferry Road; one through lane, one through and right lane and one right turn lane. A left turn lane commences 80 metres before the junction.
24. Accident records show 31 reported crashes at this intersection for the five-year period 2000 to 2004, of which three were serious injury and four minor injury.
25. There is currently significant queuing at this intersection, with on-site observations showing queues past Ferry Road to St Asaph Street.
26. The surrounding area at the intersection consists of the Washington Reserve, including a skate board park, the Christchurch Polytechnic Institute of Technology (CPIT), Catholic Cathedral College, Catholic Cathedral and Christchurch School of Music.

CONSULTATION

27. Objectives identified for the Barbadoes Street/Moorhouse Avenue intersection were to:
- Improve the visibility of traffic signals for traffic on Moorhouse Avenue.
 - Improve lane marking and signal phasing at the Moorhouse Avenue/Barbadoes Street/Waltham Road intersection.
 - Improve the safety of cyclists.
 - Maintain the capacity of Moorhouse Avenue and its intersections, including all bus movements.
28. Once the draft preferred scheme options were developed, consultation was undertaken with the surrounding community and interested stakeholders. The aim of the consultation was to implement an 'inform' consultation, that is, to provide interested and affected groups in the community with information about the project and to ensure that due consideration is given to any concerns raised, albeit, within a project that has set engineering requirements. It was also proposed that one-on-one consultation be undertaken with business operators and property owners within the proposed area that are directly affected by the proposal before the proposal was delivered to the wider community.
29. The scheme plan and consultation plan for the 'Moorhouse Avenue/Barbadoes Street Traffic Management & Safety Improvements' project was presented in a seminar to the Board on 24 August 2005.
30. Following the Board seminar consultation was undertaken directly with those stakeholders who were potentially affected by the proposed loss of parking. Feedback received during this time showed significant concern regarding the on-street parks proposed to be removed from adjacent to the Catholic Cathedral in Barbadoes Street.
31. Consequently, these issues raised were considered and the Barbadoes Street plan was amended prior to wider community consultation. The amended plan included the indentation of the kerb adjacent to the Catholic Cathedral to accommodate an additional four car parks. The updated plan was then presented to the Board in October 2005, prior to being delivered to the community for formal consultation.
32. Formal consultation was undertaken in January 2006 with the release of the 'Moorhouse Avenue/Barbadoes Street Traffic Management & Safety Improvements' booklet. The formal publicity was delivered to every business along Moorhouse Avenue from Lincoln Road to Ferry Road and to the Music Centre, the Catholic Cathedral School, the Catholic Diocese and the CPIT in Barbadoes Street.

FEEDBACK FROM CONSULTATION

33. There are three main community groups from which feedback was received in regard to the Barbadoes Street proposal; two in support and one in objection to the proposed scheme.
34. **Barbadoes Street Cultural Zone Development Group**
- This group has recently been established (in response to this project) and it is their wish to see that the current status of this part of the City, designated by the City Council as a Cultural Zone, is supported, maintained and enhanced. The group includes representatives from: Catholic Diocese, Cathedral Musical Director, Christchurch Music Centre, Christchurch School of Music, Catholic Cathedral College and Christchurch Polytechnic Institute of Technology (CPIT). Feedback was also received from five individuals reinforcing the views presented by the Barbadoes Street Cultural Zone Development Group.
35. Initially the group's objections regarding Barbadoes Street related to the removal of on-street parks adjacent to the Cathedral but this has now widened to include an objection to the use of Barbadoes Street, specifically the section between Ferry Road and Moorhouse Avenue, as an arterial route. In particular, the group is concerned that the reduction in parking will result in a negative impact on the acoustic environment, religious visitors and tourist visitors and believes that the proposal will compromise potential future proposals for the area.
36. While the Barbadoes Street Cultural Zone Development Group acknowledge that their aspirations may be outside the objectives of this proposal, they wish to see either a hold placed on the Barbadoes Street part of the project, until a longer term plan is developed by the Council for the area, or, at the very least, that the current project is altered to support the area as a cultural zone rather than moving further away from the desired outcome for the area.

37. **Cycling Advocates**

Twelve individual submissions and one from Spokes Canterbury Inc, were received in support of the proposal. These submissions gave particular support for the proposed improvement to cycle facilities.

38. **CPIT**

The CPIT's response is that it is in support of the proposal and is keen to see the cycle facilities improved. The proposal complements the cycling facilities' improvements that have recently made on-site. CPIT also agrees, and has a representative on the 'Barbadoes Street Cultural Zone Development Group', that they would like to see the area developed as a cultural zone. However, they understand this is outside the scope of this project and is a long- term plan. They would not like to see the project put on hold while this wider issue is resolved.

RESPONSE TO FEEDBACK

39. The project team took the feedback into consideration and further option investigation was undertaken, including intersection analysis. The response to the specific concerns raised during consultation is detailed below.

Minimising Removal of Parking

40. The project team recognises the Barbadoes Street Cultural Zone Development Group's concern regarding the reduction in on-street parking and the effect this will have on visitors to the Cathedral. Hence a number of alternative options have been investigated to minimise the requirement to remove car parks. However, the Barbadoes Development Group has informed us that they are not in favour of any proposal including parking on the western side. Additionally CPIT has welcomed the use of its car park by visitors to the Cathedral outside Polytechnic hours, but the Barbadoes Development Group do not favour this option.
41. There are no options, except for the status quo, which allow all parks on the eastern side to be retained while achieving the project's objectives. In particular, the objectives to improve efficiency at the Moorhouse Avenue/Barbadoes Street/Waltham Road intersection and improve safety of cyclists.

Acoustic Concerns

42. The project team has also considered the Barbadoes Development Group's concern regarding the potential effect that removing six on-street car parks, as proposed in the recommended option (Option B), will have on increased traffic noise affecting the acoustics of the Cathedral and Music Centre. The project team recognises that noise barriers can effectively reduce noise levels associated with traffic. However, for noise barriers to be successful they need to be continuous and of sufficient height and length. (See extract below). Hence, in relation to the Barbadoes Street project, the existing car parking adjacent to the Cathedral is not considered an effective traffic noise barrier. Consequently, commissioning a noise report was not considered relevant or necessary for this project, as suggested by the Barbadoes Development Group.
43. *"Significant noise reductions are possible from the adoption of roadside screens or barriers. The reduction of propagated noise depends on the height and length of the barrier. The sound shadow can be increased by increasing the effective dimensions of the obstruction or by moving it closer to the noise source. Barriers will not be effective where the line of the barrier is broken with vehicle and pedestrian openings. The barrier must be continuous (over 10's of metres) to provide significant noise reductions"* (Ref Noise Impacts of Land Transport-Stage 3, Malcolm Hunt Associates June 2004¹).
44. In fact, by improving the efficiency of the Moorhouse Avenue/Barbadoes Street/Waltham Road intersection, our proposed option (Option B) will potentially contribute towards reducing traffic noise and improving the acoustic environment. This is achieved by improved intersection efficiency of the intersection resulting in reduced queuing immediately adjacent to the Cathedral and a reduction in the number of vehicle stop/starts required. The use of effective traffic management as an effective noise reduction measure is confirmed in transport literature as stated below:
45. *"There appears to be some advantage in lowering noise impact by addressing (reducing) congestion. The aim of making the road network more efficient would hold benefits for noise, as well as other policy goals of better managing the air pollution from motor vehicles and encouraging greater fuel efficiency"* (Ref: Noise Impacts of Land Transport-Stage 3, Malcolm

Hunt Associates, Noise & Environmental Consultants, June 2004. This report provided information on possible policy options to address noise from land transport activities in New Zealand by way of preliminary recommendations for methods to manage the impact of this noise).

46. *Managing traffic can sometimes reduce noise problems...Traffic lights can be changed to smooth out the flow of traffic and eliminate the need for frequent stops and starts.*" (Ref Highway Traffic Noise, US Department of Transportation, Federal Highway Administration).

Future Cultural Zone Development

47. The project team notes the long-term issues raised by the Barbadoes Development Group, with respect to the future development of the area as a cultural zone. During option development the team has considered these issues and does not see the recommended scheme compromising future development options. The development of a scheme to fully address these long-term issues is outside the scope of the current project. The group was therefore informed that the Long Term Council Community Plan (LTCCP) submission process was the appropriate way for them to engage with Council. A submission was made and an opportunity to speak to Council was taken up by the Group. It was acknowledged that the area east of Colombo Street was identified as a key focus as part of the central city revitalisation strategy. The Turners and Growers development would provide the impetus for further development of this area.

OPTIONS

48. Three options discussed in this report include:
 - (a) Option B: The preferred option (**Attachment 1**), which includes improved lane arrangement and intersection phasing, partial on-road cycle facilities and a shared use path.
 - (b) Option C: An alternative to Option B (**Attachment 2**), which includes improved lane arrangement and intersection phasing, full on-road cycle facilities and a shared use path. This option also requires a kerb indentation to accommodate five parking spaces.
 - (c) Option A: Retain the status quo.

Preferred Option Assessment

Option B – Recommended Option

49. This option is the recommended option and is detailed in Attachment 1. The option consists of the following elements:
 - (a) Lane arrangement: Three lanes are proposed on Barbadoes Street at Ferry Road, one left/through lane, one through lane and one right turn lane. The right turn lane then diverges into two right turn lanes 80 metres before the junction.
 - (b) Cycle Lanes: A cycle lane is proposed on the eastern side of Barbadoes Street between Ferry Road and Moorhouse Avenue. A cycle lane is also proposed on the western side between Ferry Road and Coventry Street, at which point cyclists would use the shared cycleway facility.
 - (c) Shared Path: The existing footpath on the western side of Barbadoes Street between Moorhouse Avenue and Coventry Street will become a contra-flow (travel in both directions) shared cycle/pedestrian path. Signage and pavement markings will clearly designate the path as shared. The width of the shared path is 2.8 metres except where it reduces to 2 metres for a length of 50 metres at the southern end of Barbadoes Street. The design guidelines (Ref: Austroads Part 14, Guide to Engineering Practice, Bicycles) for cycle facilities recommend an acceptable width range of between 2 and 3.5 metres for a path of this nature. They acknowledge that the minimum width of 2 metres is acceptable where significant constraints limit the opportunities for a wider path. The existing brick fence on the boundary and the existing kerb line do limit the width available at this location. The design guidelines also recommend shared paths be designated with a separation line, particularly in high volume situations. The usage of the path will be monitored after implementation of the scheme and if the volumes are high the separation line will be installed. During consultation with various stakeholders, including the Royal NZ Foundation for the Blind, no issues of concern were raised regarding the shared path facility.

- (d) **Parking:** This option includes 20 P120 car parks along the eastern side of Barbadoes Street. Six car parks will be lost on the eastern side as part of this proposal.
50. This option will fulfil the shortcomings identified through the 2003 Crash Reduction Study and will result in the following social and economic benefits:
- (a) **Social:** Improvement to safety for all road users, including pedestrians and cyclists.
 - (b) **Economic:** Vehicle operating savings and travel time savings due to improved efficiency of the Barbadoes Street/Moorhouse Avenue intersection and resulting decrease in vehicle queues.
51. This option will result in the loss of six car parks on the eastern side of Barbadoes Street. However, it does retain 20 car parks along the eastern side and does not require any alteration to the kerb alignment to achieve this, as required in Option C.

Alternative Options Assessment

Option C – Alternative Option

52. This option is an alternative to the recommended option and is detailed in **Attachment 2**. The option consists of the following elements:
- (a) **Lane Arrangement:** The same lane arrangement is proposed as Option B.
 - (b) **Cycle Lanes:** A cycle lane is proposed on the eastside of Barbadoes Street between Ferry Road and Moorhouse Avenue. A cycle lane is also proposed on the western side, terminating south of Coventry Street, approximately 50 metres north of Moorhouse Avenue, at which point cyclists have the option to use the shared cycle/pedestrian path or the central cycle lane to turn right.
 - (c) **Shared Path:** The existing footpath on the western side of Barbadoes Street between Moorhouse Avenue and Coventry Street will become a contra-flow (travel in both directions) shared cycle/pedestrian path in accordance with the design guidelines as proposed in Option B.
 - (d) **Parking:** This option includes 20 P120 car parks along the eastern side of Barbadoes Street. However, a kerb indentation is required to accommodate four of these parks. Six car parks will be lost on the eastern side as part of this proposal.
53. This option will fulfil the shortcomings identified through the 2003 Crash Reduction Study and will result in the following social and economic benefits:
- (a) **Social:** Improvement to safety for all road users, including pedestrians and cyclists. This option also maximises safety and right turn options for cyclists.
 - (b) **Economic:** Vehicle operating savings and travel time savings due to improved efficiency of the Barbadoes/Moorhouse intersection and resulting decrease in vehicle queues.
54. These social and economic savings are expected to be greater than those resulting from Option B, since more cyclists are likely to use the on-road cycle lane as opposed to the shared cycle way to turn right. Hence, this option will result in a decreased pedestrian/cycle crossing demand and increased green time dedicated to the right turn movement, resulting in a safer and more efficient intersection than Option B. This option is also considered safer for both cyclists and pedestrians, due to the decrease in potential contra flow on the shared footpath, which ranges in width from 2 metres to 2.8 metres wide.
55. This option will result in the loss of six car parks on the eastern side of Barbadoes Street, as required by Option B. However, to accommodate six of the remaining 20 parks a kerb indentation is required. This indentation will result in a footpath width of 1.8m at the narrowest point.

Option A – The Status Quo Alternative Option

56. Maintaining the status quo, will result in no changes to the Barbadoes Street approach between Ferry Road and Moorhouse Avenue. However, modifications will be made at the Moorhouse Avenue/Barbadoes Street/Waltham Road intersection as part of the Moorhouse Avenue corridor project, supported by the Board on 22 March 2006. These modifications include changes to the Moorhouse Avenue and Waltham Road approaches, including buildouts, lane markings and cycle lanes.
57. Maintaining the status quo will not result in any social, environmental or economic benefits. Additionally, it is inconsistent with the Council's Road Safety Strategy, Parking Strategy or Cycling Strategy.
58. Maintaining the status quo will result in some safety benefits at the intersection (due to the buildouts and markings being installed as part of the Moorhouse Avenue corridor project), but no travel time or vehicle operating cost benefits will be gained. Consequentially, this project will not achieve a positive Benefit/Cost Ratio (BCR) and there will be Land Transport NZ funding consequences for the project.

PREFERRED OPTION

59. Option B has been selected as the preferred option, as outlined in Attachment 1 and detailed in Section 47 of this report. In summary, this option includes lane marking alterations to incorporate improved lane arrangements, partial on-road cycle facilities and a shared cycle/pedestrian path and no alterations to the kerb alignment on Barbadoes Street.
60. The preferred option has been selected because:
 - (a) It best satisfies the project's aims and objectives from the options considered, while best balancing the views of the stakeholders.
 - (b) The option will fulfil the shortcomings identified through the 2003 Crash Reduction Study and meet the objectives set out in the Council's Road Safety Strategy, Parking Strategy and Cycling Strategy.
 - (c) Option B will improve the efficiency of the intersection and reduce queuing, providing economical benefits in accident savings, travel time savings and vehicle operating savings. The option will also contribute to reduced vehicle noise as a result of reducing the number of effective vehicle stops.
 - (d) Although, six car parks will need to be removed on the eastern side of Barbadoes Street, these parks have been unable to be accommodated by any other scheme while meeting the project objectives.
 - (e) During option development the project team has taken into consideration the long-term issues raised by the Barbadoes Street Cultural Zone Development Group, in particular the future development of the area with regard to its current designation as a cultural zone. Consequently, the proposed scheme is one which will not impede the adjacent footpath or frontage of the Catholic Cathedral or Music School. The scheme simply proposes lane marking alterations along Barbadoes Street, as an interim measure to address the current intersection efficiency, safety and cycling issues. Hence, the option does not compromise the area as a cultural zone or compromise any future development options.
61. The development of a scheme to fully address the long-term issues is outside the scope of the current project. However, these issues have been conveyed to the Central City planning team, who are taking them into consideration in their long-term inner city plan developments.