

6. QUEENSPARK BUS PRIORITY PROJECT - HILLS ROAD

General Manager responsible:	General Manager City Environment
Officer responsible:	Manager, Transport & Greenspace Unit
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PURPOSE OF REPORT

1. The purpose of this report is to seek the Board's approval to proceed to consultation, design and construction of the trial Bus Boarder as shown in the concept plans in the attachment 1 to the agenda.

EXECUTIVE SUMMARY

2. Approval is sought from the Board to carry out a trial of two Bus Boarders in Hills Road for the #70 Queenspark bus route (see attachment 2). This includes a programme of community consultation (see attachment 3) designed to be undertaken in conjunction with the trial.
3. The #70 Queenspark bus route is on one of three routes where bus priority is an issue.
4. This report outlines the proposal to install and trial two Bus Boarders – considered to be potential solutions to bus priority in congested, slow moving traffic such as is experienced in the trial area during afternoon peak traffic.
5. A Bus Boarder is an extension of the footpath and raised kerb into the nearside parking lane such that the bus can stop without leaving its position in the traffic stream.
6. A Bus Boarder in Hills Road (a two lane road with a flush median) will cause some motorists to overtake a stopped bus, whilst other motorists may choose to stop behind the bus. The purpose of the trial is to evaluate motorists' behaviour and whether it can be influenced by geometric layout changes.
7. Average stopping time for north-bound buses on Hills Road has been measured at 12 seconds, ranging from 3 to 45 seconds. On average, every fourth bus stops at a particular stop.
8. The bus, by retaining its place in the traffic flow, is expected to enjoy a faster journey.
9. Other options such as a bus lane have been considered, and are briefly discussed.
10. The trial parameters and the criteria that will be used for decision-making are based on bus travel time improvements and driver behaviour.
11. Council staff and the consultant recommend that the construction and trial of two Bus Boarders is the most cost effective means of evaluating the Bus Boarder as a bus priority measure, and is the means that is least likely to inconvenience residents.

FINANCIAL AND LEGAL CONSIDERATIONS

12. The total estimated cost of this project is approximately \$40,000. The project is funded from the Passenger Transport Infrastructure, Bus Priority budget of \$120,000 for 2006/07. There is also budget allocated in 2007/08 for the Queenspark Bus Priority Project.
13. There are no known legal implications for this project. Land Transport New Zealand is a stakeholder and any potential for legal implication will be fully addressed with that organisation.
14. No Community Board resolutions are required because the bus stop locations will not be changed.

STAFF RECOMMENDATION

It is recommended that the Board approve the Hills Road Bus Boarder trial, as illustrated in attachment 1 of the agenda, to proceed to consultation, design, and construction.

CHAIRPERSON'S RECOMMENDATION

That the staff recommendation be adopted.

BACKGROUND

Christchurch City Council Bus Priority Project

15. Three key bus routes have been identified as needing measures to help buses break through traffic congestion to make public transport faster and more reliable. (Details of the Christchurch City Council Bus Priority project can be read at the Council's website <http://www.ccc.govt.nz/environment/Transport/BusPriority/>).

16. These corridors are:

Main North Road/Papanui Road (QEII Drive to the city)
Colombo Street/Cashmere Road (Princess Margaret Hospital to the city)
Queenspark bus route (to the city via New Brighton Road/Shirley Road/Hills Road)

This project applies to the #70 Queenspark route.

17. Among the tried and tested bus priority measures that will be considered for different parts of these corridors are:

- Improvements to bus stop locations and length
- Special traffic signal controls and layouts for buses
- Bus lanes (full and part time)
- Other methods such as Bus Boarders and clearways, that will safely give buses priority over other vehicles.

This project focuses on point d above.

18. One of the main problems facing bus operators and reducing the attractiveness of travel by bus in Christchurch is that buses have to compete with other vehicles for space in the traffic stream. Timetable reliability is at risk especially at peak times, because the buses have to wait to rejoin the traffic stream after picking up and putting down passengers.

The #70 Queenspark route on Whitmore Street/Hills Road

19. See attachment 2 for map showing the bus route and location of the proposed trial Bus Boarders.

20. The route has shown steady growth over the last few months and Environment Canterbury (ECan) expect that when the service is fully reviewed again in 2010 (when the current contract expires) it is likely to be increased from a 15 minute to a 10 minute frequency.

21. ECan and Christchurch City Council are currently writing a new Passenger Transport Strategy (the draft of which is going out for consultation in September 2006) which includes targets set for ECan by the community, to double patronage again by 2012.

22. This part of the route suffers from congestion, with high volumes of slow moving traffic mainly over three hours in the afternoon and early evening peak period. In several areas the traffic slows down to around 15-20kph. Typically at these speeds and high volume, drivers are reluctant to let a bus that has pulled into a bus stop rejoin the traffic stream.

23. There are two bus services operating north-bound on Hills Road/Whitmore Street - #70 Queenspark (48 buses between 7.30am and 6pm) and Kainga (one per day). The #70 Queenspark service enjoys the fifth highest passenger patronage in Christchurch.

24. During the peak (3.30pm - 6pm), there are 14 Queenspark buses travelling north. These buses leave Hoyts at 5,10 and 15 minute intervals.

25. It is therefore important to introduce some initiatives to resolve this problem if bus usage is to be encouraged and ECan to meet its targets.

26. The problems created for buses by the congestion are particularly noticeable in Fitzgerald Avenue, Whitmore Street and Hills Road, from Heywood Terrace to Shirley Road, in the afternoon peak. The Shirley Road/Warrington Street intersection acts as a bottleneck, causing the slow moving traffic stream to back up, sometimes all the way back to Heywood Terrace.
27. Bus priority measures for Fitzgerald Avenue approaching Bealey Avenue are currently under investigation and will be reported to the Community Board in due course.
28. In the morning, the south-bound traffic congestion is nowhere near as great, due to the capacity of the Bealey Avenue/Fitzgerald Avenue/London Street/Whitmore Street intersection. Thus there is at present no need for new bus facilities on the eastern side of the road. However, a recent Community Board decision to remove all parking along the eastern side of Hills Road between Shirley Road and Warden Street will be implemented by the time this trial begins.
29. Four-laning of this part of Whitmore Street and Hills Road is currently on the Capital Works Programme for 2011/12. However, there is urgent need to provide some relief before this time, especially for bus transport, in order to achieve the city's stated aim of increasing patronage.

The case for a trial of Bus Boarders on Hills Road between Bealey Ave and Shirley Road

30. The congestion occurring during peak periods indicates that there is a need for some form of bus priority measure in this stretch of Hills Road.
31. The built out Bus Boarder on a two-lane road is a new concept to Christchurch. There are several similar facilities in use in the four-lane section of Fendalton Road. Cathedral Square has bus stops within the traffic lanes which have been operating for some time now. There is also a bus stop in Ferry Road near the Woolston Fire Station which occupies the majority of the traffic lane, and operates quite successfully.
32. Council staff and consultants believe that this location is ideal for trialling the Bus Boarder concept, and have confidence that it will be successful if the benefits can be conveyed to the public. This will then increase the efficiency of the services to Queenspark.

Proposed location for these Bus Boarders in Hills Road

33. Attachment 1 shows the proposed location and layout of the two Bus Boarders in detail.
34. One of the proposed Bus Boarders would be located on the west (north-bound side) of Hills Road between Dudley Street and Edgeware Road.
35. The other Bus Boarder in the trial would be located on the west (north-bound side) of Hills Road just north of the Warden Street intersection.

Why a trial?

36. Prior to four-laning Hills Road, there is no effective way of addressing congestion for all traffic using this corridor. The trial proposed in this report is expected to bring improvements for public transport and is considered to represent the best possible solution, compared with alternatives such as a dedicated bus lane, which is discussed later.
37. Council staff recommend introducing the Bus Boarders in Hills Road as a trial. The trial will include consultation with stakeholders and the general public, whose views will be taken into consideration in later decision-making about installing this type of bus priority measure in some other areas of the city.
38. Both proposed trial locations have a flush median separating the single traffic lanes. It is not known how motorists will react to a bus stopped in the traffic lane ahead of them. The gap between the stopped bus and the flush median will be about 2.0m wide. Some motorists may choose to utilise the flush median and drive around a stopped bus. Other motorists may decide to stop behind the bus and wait until the bus gets moving again. Once the first motorist has stopped, the behaviour of subsequent motorists might change, making them more inclined to stop as well. Part of the trial will be to find out whether motorist behaviour changes with the gap between the stopped bus and the flush median being increased or decreased.

The Bus Boarder



Bus Boarder in Greater Manchester



Bus Boarder in Auckland

39. The Bus Boarder is an extension of the footpath and raised kerb into the nearside traffic lane such that the bus can stop without leaving its position in the traffic stream.
40. Bus Boarders are known to be in use in Auckland, Wellington, and the UK (Greater Manchester, Plymouth, Peterborough are examples).
41. The Bus Boarder is designed to reduce the 'dwell time' at bus stops, thereby reducing journey time and improving reliability
42. A Bus Boarder:
 - a) Reduces the time taken for passengers to board and alight.
 - b) Reduces delay in re-entering the flow of traffic where buses have stopped.
 - c) Lets the road space ahead of a stopped bus clear out from traffic, enabling the bus to travel faster after leaving the stop.
43. Other benefits of a Bus Boarder include:
 - a) The enlarged waiting area can be more attractive for the waiting passengers.
 - b) Improved access to the bus for passengers by allowing the bus to line up parallel to the kerb, largely without manoeuvres.
 - c) The bus driver can more easily see the waiting passengers.
 - d) Vehicles cannot illegally park at the bus stop. When vehicles are parked at either side of the bus stop, it is often difficult to manoeuvre a bus into the bus stop and close to the kerb for convenient passenger loading and unloading. As a result, the rear door is often not close to the kerb, meaning that passengers have to step onto the carriageway, rather than the elevated footpath, which is often difficult for elderly people. A bus Boarder overcomes all those problems.
44. Further information about the use of Bus Boarders in the UK can be read at http://www.tfl.gov.uk/buses/downloads/accessible_bus_stop_design_guidance.pdf and in Auckland at <http://www.aucklandcity.govt.nz/auckland/transport/buses/first.asp>

How does a Bus Boarder work?

45. In other cities around the world the Bus Boarder is used to alleviate two problems – that of illegally or carelessly parked vehicles blocking access to the kerbside bus stop or bus bay, and that of re-entering the traffic stream after stopping.
46. In congested, slow moving traffic, buses take longer to re-enter the traffic stream. There is evidence indicating that this is the case in Christchurch and that it is a particular contributor to delays on the #70 Queenspark route. Compounding the problem is the legal situation in New Zealand where drivers are not obliged to give way to a bus indicating to leave a bus stop. The common situation in other countries is that buses do have the right-of-way when leaving a bus stop. A Bus Boarder enables the bus to stop without leaving the traffic flow.

47. Unrestricted or illegal parking often prevents buses reaching stops or aligning correctly with the kerb to ensure close and level boarding. Extending the footway out into the nearside lane to create a boarding and alighting platform called a Bus Boarder may help to remove these sources of delay and to improve safety for passengers.
48. Provision of a raised kerb at a Bus Boarder can be a further deterrent to obstructive car parking or stopping to pick up or set down passengers. Other vehicles may park in the lee of the Boarder, but the position of the bus in the main flow is maintained and passengers may have easier access to the bus.
49. Clearly, the road width needs to be sufficient to permit the construction of a Boarder without the possibility of a stopped bus blocking the passage of oncoming vehicles or without causing unacceptable delay to following traffic.

Will it create further delays for the traffic stream as a whole?

50. Critics will immediately see that the Bus Boarder stops in the only traffic lane, causing the vehicles behind it to stop also. First impressions are that the Bus Boarder will cause more traffic delays. However, the proposition of this project is that the stopping time at each Bus Boarder will be brief, and the buses will be able to move off quickly and make very good progress to the next Bus Boarder and beyond. Thus queues of general traffic are ultimately displaced by one bus length, but for a bus, this will bring improvements in travel speed and less delay experienced at a bus stop.
51. Christchurch buses, with Metro Card fare paying technology, are now experiencing particularly quick loading time – on average this is 5-6 seconds per person. Our pre-trial observation of the current bus stop situations carried out at five bus stops on this section, by ECan on Friday 28 July and Monday 1 August 2006 (0730hrs to 1830hrs) shows that relatively few passengers use these stops and that the buses do not stop at all bus stops.
52. The observations showed, per day:
 - Fifty-six bus stopping events, out of a potential 240 events (if all buses had stopped at all bus stops) - on average, buses stop at every fourth bus stop only
 - Eighty-one passengers alighting or boarding
 - Average stop length was 14.9 seconds for boarding, 10.2 seconds for alighting – averaging overall at 12 seconds per stop
 - Minimum stopping time was 3 seconds. Maximum stopping time was 45 seconds.
 - In the main the stops were for one passenger, with an average of 1.45 passengers/stop.
53. This information and that from further studies will enable us to model the impact on traffic flows.

How will bus borders work on a two lane road?

54. In many other situations the Bus Boarder is used on a four-lane road, and the traffic behind the bus can change lanes to overtake it at each Bus Boarder stop, as happens on Fendalton Road. However, this lane changing manoeuvre in itself can cause problems, especially in congestion.
55. On a two-lane road such as Hills Road, there is still room for cyclists and motorcyclists to overtake the bus. As discussed above, motorists may or may not overtake a stopped bus. The purpose of the trial is to measure road user behaviour, and whether this is influenced by geometric layout changes such as different lane widths.

Should it operate 'full time' or just a few hours during the peak?

56. One option is to operate the Bus Boarder trial for only specified peak hours in the afternoon, and having a conventional bus stop adjacent, that would operate during the rest of the day. However, the project team considers that this would cause confusion among bus drivers and passengers as to where to stop/wait. In addition, this option would take up double the kerbside length for the bus stop, thus reducing available parking space.
57. Thus this proposal is for the Bus Boarders to operate on a full time basis, ie 24 hours a day, 7 days a week on Hills Road.

What issues do we expect for cyclists?

58. Cyclist behaviour around this Bus Boarder is anticipated to be similar to that experienced in other situations where a bus stop is located in a kerbside cycle lane – that they will overtake the bus on the carriageway. Such situations arise in Fendalton Road, Main Road Redcliffs and Ferry Road. In the development of the Fendalton Road bus facilities, cyclist group representatives said that some cyclists may prefer to undertake the bus on the left hand side, so the Council built a footpath cycle bypass. Consultation will be carried out to obtain cyclists' viewpoint based on their experience in Fendalton Road.
59. At this point Council staff expect cyclists to overtake the bus on the right, in the carriageway, and see no problem with this. Less confident cyclists will choose to wait behind the bus until it moves off.

What issues do we expect for motorists?

60. The key reason for carrying out this trial is that there is a lack real knowledge about how motorists in Christchurch will behave when faced with a Bus Boarder on a two-lane road.
61. Staff expectation is that motorists will overtake the bus on the right, but that they will do this carefully and slowly as the available carriageway for this manoeuvre will be narrow. Some motorists will stop behind the bus because they perceive the gap to be too narrow.
62. Behaviour will depend somewhat on driver personality – once one driver has proceeded past the bus, others may follow; however, once one is stopped behind a bus others behind are expected to stop also.

Why not other measures?

Bus Lane

63. Attachment 4 shows a bus lane option.
64. The relatively low frequency of bus use suggests that a dedicated bus lane (which involves moving the flush median and pedestrian islands, localised, part time parking bans on the east side of Hills Road, and complicated measures to enable the bus to turn right at Shirley Road) is not justified.
65. A bus lane could operate during peak periods only, reverting to parking or be available for all vehicles at other times.
66. A north-bound bus lane would by its nature be located adjacent to the nearside kerb, and would involve the removal of all parking from the western side of Whitmore Street and Hills Road between Bealey Avenue and Shirley Road at peak times. As already mentioned, parking has just recently been removed along the eastern side of Hills Road between Shirley Road and Warden Street. Parking restrictions would have to be enforced strongly – one car parked in the bus lane would disrupt the bus travel and negate the purpose entirely.
67. A bus lane could be terminated just north of Warden Street, with buses re-entering the traffic stream and reaching the right turning lane. This would be similar to a bus leaving a bus stop at present.
68. As an alternative to terminating a bus lane just north of Warden Street, it could be continued up to the intersection with Shirley Road and Warrington Street. However, the buses turn right at this intersection. To accommodate right turning buses into Shirley Road would require significant modification to the signal sequence – and would severely compromise the efficiency of the intersection without necessarily providing benefits to buses.
69. Thus, a bus lane is not considered technically feasible or desirable for the full length of Hills Road/Whitmore Street due to operational problems at the Hills/ Shirley/Warrington intersection. A bus lane terminating just north of Warden Street is not considered desirable due to the parking loss along the entire western side south of Warden Street. Therefore Council staff recommend a trial of two Bus Boarders, on the basis that that Bus Boarders may be a more efficient means of creating bus priority in this section of Hills Road.

CONCLUSION

70. There is an acknowledged need to implement bus efficiency measures on the west side of Whitmore Street and Hills Road in the evening peak period. The suggested Bus Boarder trial is seen as being the most cost effective measure for this location, and is considered to be the option that will have the least impact on residents. Council staff believe that with good publicity, motorists and other public will see this option in a positive light, particularly compared with other more costly alternatives. It is hoped that the measurements carried out during this trial will prove that Bus Boarders are successful and that they should be used as an effective tool in similar problem areas across the city.