



20 November 2020

## Project Feasibility Summary

### 1 Introduction

Waverley Council (WC) has engaged GHD to develop and assess design options that will improve pedestrian and vehicle movement on Calga Place, as well as improve pedestrian user safety through the cutting. GHD prepared an options assessment report dated 9 July 2020 and presented the findings to WC on 2 July 2020. The following options were presented to Waverly Council as part of the Options Assessment Report:

- Option 1: Replacement of the temporary walkway constructed by WC with a permanent concrete footpath that connects to the existing footpath to the north of the cutting and extends to Macpherson Street. This option also considers the widening of existing footpaths along Calga Place to the north of the cutting, where possible, to facilitate pedestrian usage;
- Option 2: Converting Calga Place, starting at Bronte Road and ending at Macpherson Street, to a shared zone for both pedestrian and vehicle usage. This option requires the removal of the existing footpath and relocation of existing parking spaces along the eastern side of Calga Place.

After review of the options assessment, WC selected Option 1B, a variation of Option 1, as their preferred. Option 1B proposes widening the existing footpaths from the northern end of Calga Place to the start of the cutting to a width of 2.5 m by realigning a section of the western kerb line and retaining wall near the steps from Bronte Road. This option also considers reducing the traffic lane width within the cutting to 3 m, which provides an opportunity for a 3 m concrete footpath to be installed through the cutting and a 1.0 m wide footpath from the southern end of the cutting to Macpherson Street.

After selection of the preferred option, WC requested GHD to conduct a feasibility study of the following sub-options for widening the footpaths at the northern end of Calga Place:

- Sub-option A (solution proposed by the preferred Option 1B): Relocation of the heritage wall near the steps from Bronte Road and existing kerb line, on the western side of Calga Place (refer Figure 2-1);
- Sub-option B: Widening the existing footpaths near the Bronte Road steps to the east using a cantilever system (refer Figure 2-2).

GHD attended a meeting with WC on 1 October 2020 to discuss the environmental and heritage constraints for Sub-option A. After the discussion, WC requested GHD to also consider a third option in this feasibility study:

- Sub-option C: Removal of one parking space next to the steps from Bronte Road, on the western side of Calga Place and replace with motorbike parking spaces.

## 2 Feasibility Study

### 2.1 Option A– Heritage wall relocation

Option A, as proposed in the preferred option selected by WC, considers widening the footpaths to the west, which requires an approximately 12 m section (the length of two parking spaces) of retaining wall and 25m of existing kerb line to be relocated up to 600 mm behind its original location (as shown in Figure2-1).



Figure 2-1: Option A

### 2.2 Option B – Cantilevered footpath

Option B considers the widening of approximately 25 m of existing footpath to the north of the Bronte Road stairs (as shown in Figure 2-2). This is achieved by removing the existing footpath and installing a new retaining wall and cantilevered footpath to widen the footpath to the east. By installing the cantilevered footpath, the heritage wall along the western side of Calga Place can remain in place (see Option A).

Figure 2-2: Option B

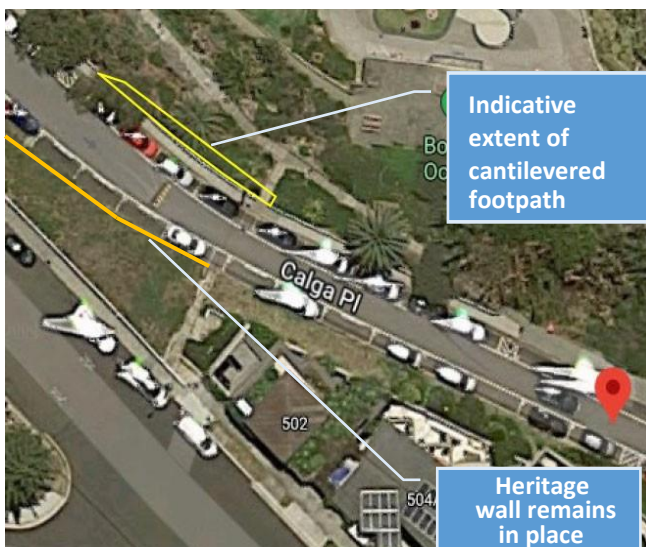
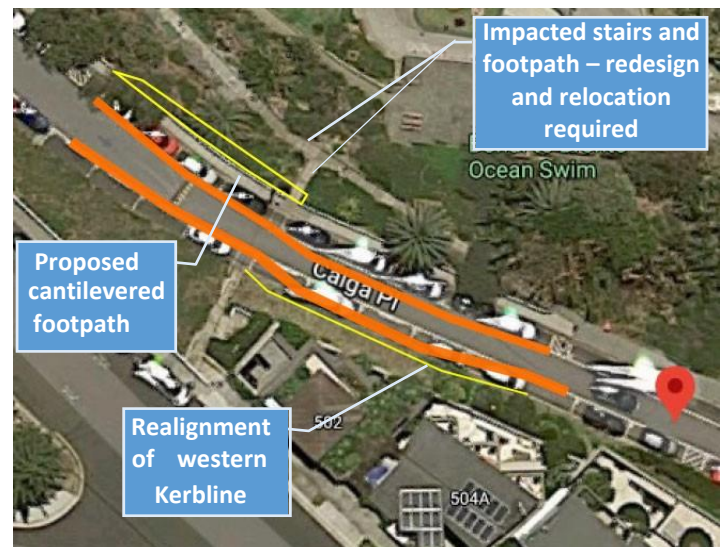


Figure 2-3: Impacts of Option B



As an alternative, Option B also considers the widening of approximately 50m existing footpath to the north and south of the Bronte Road stairs (as shown in Figure 2- 4). This is achieved by removing the existing footpath and installing a new retaining wall and cantilevered footpath to widen the footpath to the east. By installing the cantilevered footpath, the heritage wall and kerb along the western side of Calga Place can remain in place.

Figure 2-4: Option B 50m



If selected, the cantilevered footpath and retaining wall will require additional structural designs, as well as additional geotechnical investigations to determine the bearing capacity of the existing ground conditions.

The cantilevered footpath will have significant impacts on the existing trees and vegetation to the north of Calga Place. These are all within the local conservation area, which means they will have to be assessed in the REF.

The cantilevered footpath will also impact on the existing stairs and footpaths to the north of Calga Place. By extending the footpath to the north, the existing stairs and footpaths down at the South Bronte Amenities building will also have to be adjusted, which might require additional retaining walls.

The existing electrical pole near the existing stairs will have to be relocated to match the proposed new footpath alignment.

The existing handrail will have to be relocated and installed along the edge of the new footpath.

The cost implications of this option will be significant, as it requires significant demolition works, excavation, tree removal and concrete works. The knock-on effect to the existing footpaths and stairs to the north will also add significant costs to this option, as additional footpaths and retaining walls will be required.

The advantages and disadvantages for this option is similar for both the 25m and the 50m cantilevered footpath, with the main advantage being the existing heritage wall and kerb alignment can be retained along the east.

The disadvantages for this option includes the additional design and construction costs, impacts on the LCA trees and planting, longer construction program, relocation of electrical services and the knock-on effect to existing stairs and footpaths.



## 2.3 Option C – Parking Space Removal

Option C, considers widening the footpath to the west, which requires the removal of one Bronte SLSC parking space next to the steps from Bronte Road, on the western side of Calga Place and the replacement of the parking space with motorbike parking spaces (as shown in Figure 2-5). The amount of motorbike parking spaces available in place of the car parking space will be confirmed as part of the detailed design.

Option C would also require realignment of approximately 25m of the western kerblines to be relocated up to 600 mm behind its original location (as shown in Figure 2-5). This should have minimal impact on the slope of the grassed area and for parked cars opening doors.

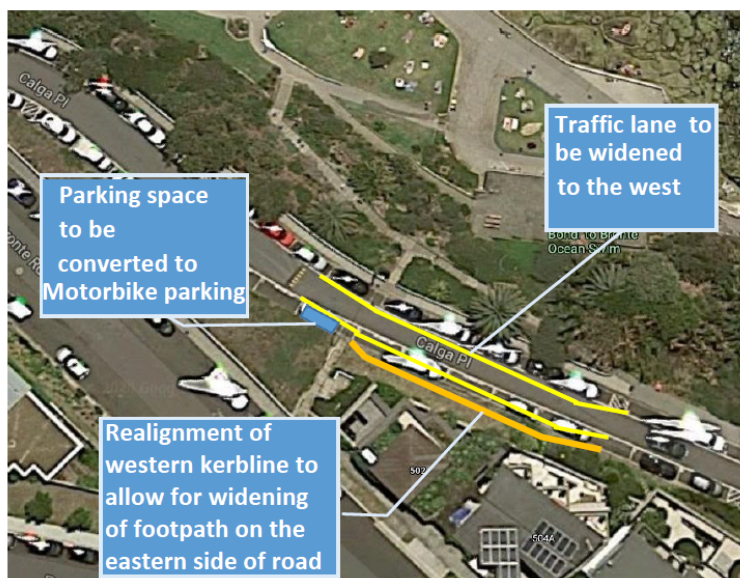


Figure 2- 5: Option C

By removing one Bronte SLSC parking space, the heritage wall along the western side of Calga Place can remain in place, therefore avoiding any impacts on the heritage wall. Option C also does not have extensive impacts on the environment and existing infrastructure like Option B.

To further mitigate the impact of the loss of one Bronte SLSC parking space for a car, the space will be used for motorbike parking instead, which will therefore increase the parking spaces for motorbikes on Calga Place. The feasibility of adding motorbike parking to this location will be confirmed as part of the detailed design stage.

The realignment of the western kerb line to allow for widening of footpath on the eastern side of road (shown in Figure 2-6) is a common design feature in all options considered, however whilst Option B results in a bend in the road (shown in Figure 2-5), Option C does not. Option C will allow for a smoother transition and this will maintain the safety for the road users and avoid impacting upon the driver's experience.

This option is expected to have lower costs for design and construction than Options A and B and it would avoid the need to potentially go through a DA process.

### 3 Advantages and disadvantages

A summary of the advantages and disadvantages of Options A, B and C are shown below in Table 1.

**Table 1: Summary of Feasibility Study**

	Option A: Heritage wall relocation	Option B: Cantilever footpath	Option C: Removal of one parking space
<b>Advantages</b>	<p><b><u>Outcome:</u></b> Desired outcome of widened footpaths and reduced traffic speeds is achieved but requires heritage assessments.</p> <p><b><u>Environmental Impacts:</u></b> No significant environmental impacts expected.</p> <p><b><u>Cost:</u></b> Relocation of wall costs less than construction of cantilevered footpath.</p> <p><b><u>Parking Spaces:</u></b> Unaffected</p>	<p><b><u>Outcome:</u></b> Desired outcome is achieved, but requires significant disturbance and construction works.</p> <p><b><u>Heritage:</u></b> No heritage impacts expected.</p> <p><b><u>Parking Spaces:</u></b> Unaffected</p>	<p><b><u>Outcome:</u></b> Desired outcome achieved with minimal disturbance.</p> <p><b><u>Heritage:</u></b> No heritage impacts expected.</p> <p><b><u>Parking spaces:</u></b> Increase in motorbike parking spaces.</p> <p><b><u>Environmental Impacts:</u></b> No significant environmental impacts expected.</p> <p><b><u>Cost:</u></b> Removal and replacement of line marking costs the least of all 3 options.</p> <p><b><u>Time:</u></b> No additional time required for design or development applications.</p>



	Option A: Heritage wall relocation	Option B: Cantilever footpath	Option C: Removal of one parking space
	<p><b><u>Heritage:</u></b> Relocation of heritage wall will require preparation of a SoHI and ADDA to accompany an REF.</p> <p>2-3 weeks to prepare SoHI, ADDA and REF.</p> <p><b><u>Existing infrastructure:</u></b> Relocation of wall and minor adjustment of existing stairs on western side of Calga Place.</p> <p><b><u>Time:</u></b> Additional time required for preparation of SoHI, ADDA and REF.</p>	<p><b><u>Existing Infrastructure:</u></b> Bend in the road south of Bronte stairs affecting safety and user experience.</p> <p>Demolition and reconstruction of stairs east of Calga Place required.</p> <p>Adjustment of footpaths east of Calga Place required.</p> <p>Light pole to be relocated or adjusted for cantilever footpath.</p> <p><b><u>Environmental impacts:</u></b> Significant environmental impact. Clearing of trees and vegetation required to construct cantilevered footpath, redesigned stairs and relocation of footpaths.</p> <p>This option might require additional approvals or assessments due to potential impacts on native plant species.</p> <p><b><u>Cost:</u></b> Additional design costs for structural engineering and geotechnical investigations and design.</p>	<p><b><u>Parking spaces:</u></b> loss of one parking space for cars. The loss of one parking space will have to be coordinated with Bronte Surf Life Saving Club and will potentially have to be replaced somewhere else.</p> <p><b><u>Existing Infrastructure:</u></b> Readjustment of existing stairs on western side of Calga Place.</p>



	Option A: Heritage wall relocation	Option B: Cantilever footpath	Option C: Removal of one parking space
		<p>Construction costs for cantilevered footpath is expected to be significantly more than relocation of heritage wall.</p> <p>Additional costs to redesign stairs and relocation of footpaths east of Calga Place.</p> <p><b>Time:</b> Additional time required for the structural design of cantilevered footpath, undertaking geotechnical investigations prior to detailed design, redesign of stairs and relocation of footpaths. Expected to add 4-8 weeks to the design program of the project depending on required investigations.</p>	
Footpath width at pinch point (Near stairs from Bronte Road)	2.5m	2.5m	2m
Footpath width within Bronte Cutting	3m	3m	3m
Estimate cost for Option	<p><b><u>\$110,000</u></b></p> <p>The estimated fee above includes the development</p>	<p><b><u>\$250,000</u></b> 25m</p> <p><b><u>\$400,000</u></b> 50m</p> <p>The estimated fee above includes the design and</p>	<p><b><u>\$40,000</u></b></p> <p>The fee estimation above includes the removal of</p>

	Option A: Heritage wall relocation	Option B: Cantilever footpath	Option C: Removal of one parking space
	of the Statement Of Heritage Impact, Aboriginal Archaeological Due Diligence Assessment and Review of Environmental Factors. Construction fees for the relocation of the wall and existing kerb line are expected to range between \$75,000 – \$90,000.	construction fees for the installation of a 25 m/ 50m long section of cantilevered footpath. The construction of the cantilevered footpath is expected to range between \$200,000 – 220,000 25m \$350,000 - \$370,000 50m which includes the reconstruction of the stairs and footpaths to the east, the relocation of the existing electrical pole and the removal of vegetation.	the existing parking space line marking and replacement line markings for the new motorbike parking spaces. It also includes the realignment of the western kerb line to the south of the existing stairs

## 4 Conclusion and recommendations

Considering the advantages and disadvantages of Option A (relocating the heritage wall), Option B (replacing the existing footpath with a cantilevered footpath) and Option C (removal of one parking space) discussed in this feasibility study, GHD recommends Option C as the preferred option for widening the footpath. This recommendation is based on the fact that Option C avoids relocating the heritage wall along the west of Calga Place, is the cheapest solution, has minimal impacts on other existing infrastructure in the area and will have the smallest impact on the delivery program of the project.

Option A, whilst it is preferred over Option B, requires the relocation of the heritage wall which results in heritage assessments and potential DA processes for approval. Option A was therefore not considered a solution as favourable as Option C.

Option B, which also avoids relocating the heritage wall and realignment of the kerb along the west of Calga Place, has significant impacts on existing street infrastructure and the environment and will cost five to ten times as much as Option A, and therefore is not considered to be a favourable solution.