

Appendix 1

Urban Design - Preliminary Design Philosophy Statement

TRANSIT NEW ZEALAND

CAMBRIDGE BYPASS

URBAN DESIGN
PRELIMINARY DESIGN PHILOSOPHY STATEMENT

Ref: 2724

BREWER DAVIDSON

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INTRODUCTION

Transit New Zealand (Transit) is wishing to confirm the extent of the designation required for the Cambridge Bypass section of the Waikato Expressway. Since previous reports have been completed the northern residential section of Cambridge has grown out to the southern edge of the designation, and Waipa District Council are proposing an industrial zone at Hautapu along the northern edge of the designation. Therefore the context issues for the Cambridge Bypass Project (the Project) have shifted from largely rural landscape effects to a mix of rural and urban effects.

The **Contextual Analysis** firstly looks at the larger scale relationship between Cambridge and the Project to establish themes for the whole corridor length.

The corridor is split into two sections defined by industrial and residential landuse along the route. The **Hautapu Section** looks at context issues for the Cambridge Jockey Club and the proposed industrial zone. The **Cambridge North Section** looks at context issues for residential landuse stretching from Victoria Road to Thornton Road. The **Victoria Road Interchange** is examined separately given its future significance as the major entry to Cambridge from the North.

Although some design solutions are suggested these are only for the purpose of testing the required extent of designation. The report is more an **Urban Design Framework** for subsequent design phases to utilise.

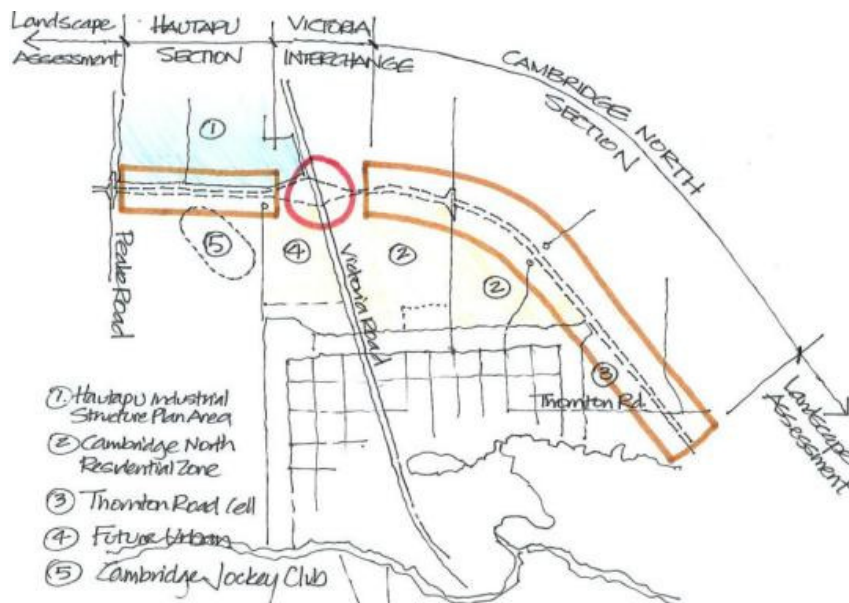


Figure 1: Corridor Urban Design Sections



Figure 2: Potential growth cells around Cambridge

CONTEXTUAL ANALYSIS

Cambridge Town Centre

Cambridge is a town with a special urban design character. The grid street pattern and Town Belt contrast with the natural forms of Karapiro Stream, Waikato River and Lake Te Koutu to create unique amenity. The concentration of heritage buildings forms a unique commercial and community centre for the town. The risk with bypass projects is that they can undermine commercial viability of town centres, but given the quality of the town centre removal of through traffic will only improve its attraction for visitors and local residents.

Victoria Road is Cambridge's main street and a diagonal alignment sets it apart from the gridded street backdrop. Mature trees and a central median from the removed railway alignment accentuate the significance of the road. Victoria Road along with other main streets and open spaces contribute to Cambridge's branding name of 'Town of Trees'.



Figure 3: Tree lined street in Cambridge (courtesy Waipa District Council)

These last two points have significance because Victoria Road extends out to the Cambridge Bypass route and the interchange will become Cambridge's main entry point from the north. Extension of street tree planting out to the interchange and integration with the interchange landscaping will create a seamless entry experience. An ordered tree planting plan will mask the curving cul-de-sacs of Cambridge North which seem to be out of character with central Cambridge. Although streetscape improvements on Victoria Road are Waipa District's responsibility an opportunity for integrated design exists.

Landscaping will form part of the mitigation features along the Cambridge Bypass Project's edges. Native planting is appropriately favoured in current Transit projects to create distinctly New Zealand environments, but Cambridge's character is largely established through ordered planting of exotic oak and plane trees. A regular rhythm of trees along the Bypass corridor will establish a town edge that is consistent with Cambridge's character.

Cambridge Bypass should be considered as a **Second Town Belt** to establish a new urban edge now that Cambridge North has jumped across the existing Town Belt. Although kerbside paths and trees are not possible with a state highway, regular tree planting and walking/cycling paths located safely within the corridor will create a positive edge to Cambridge. This can reinforce the image of Cambridge, attract visitors and enhance the road users' experience.

CAMBRIDGE NORTH RESIDENTIAL

Existing Conditions

Waipa District Council has included a 30 metre wide landscape buffer along the northern edge of the Cambridge North Residential Zone. This includes the swale and cycle/pedestrian path visible in Figure 5. It has been assumed that the fence in Figure 5 is the designation edge so the unplanted grass area on the left is approximately 15 metres wide.

The swale and footpath have been well landscaped but the 1800mm high back fences detract from the area visually and create passive surveillance issues. However removing the fences would leave less security and no privacy for rear yards to the houses. This demonstrates the issues of open spaces being located along back fences of houses.



Figure 4: Landscape buffer at Watkin Road. Bypass designation to left of fence.



Figure 5: Back fences dominating landscape buffer.

This is mentioned for consideration in the future urban area to the west of Victoria Road. Locating the swale in a street reserve will mean houses front yards look on to footpath and cycling routes. Given that it is best to have north facing rear yards then swales and pedestrian/cycle routes are best located along the local roads behind the houses. However retaining the existing swale and footpath makes sense for the Cambridge Bypass Project.

The Town Belt and the Cambridge Bypass route join together midway between Watkin & Thornton Roads and this presents an opportunity to visually integrate the two. However the Town Belt in this area consists of largely bare paddocks so gives no cues for landscape themes for the Cambridge Bypass Project.

The route crosses Thornton Road at the St. Kilda Road intersection. Thornton Road assumes more importance as a entry route with the proposed severance of Watkin Road. A nursery business occupies the St Kilda Road corner and higher priced houses on Athlone Drive and Thornton Road adjoin the route.

The land along the Cambridge North Section is flat with no scheduled trees, archaeological or heritage items affected by the route.



Figure 6: Thornton Road looking east to St Kilda Road on the left.

Design Issues

Planting themes could echo the Town of Trees concepts proposed in the Contextual Analysis. This approach would lead to an asymmetric planting plan with an urban southern edge marked by a line of ordered trees contrasting with the rural northern edge. This strategy also justifies extra width on the southern side to accommodate the large trees, lower screen planting and maintaining existing swales and footpath (Figure 8).

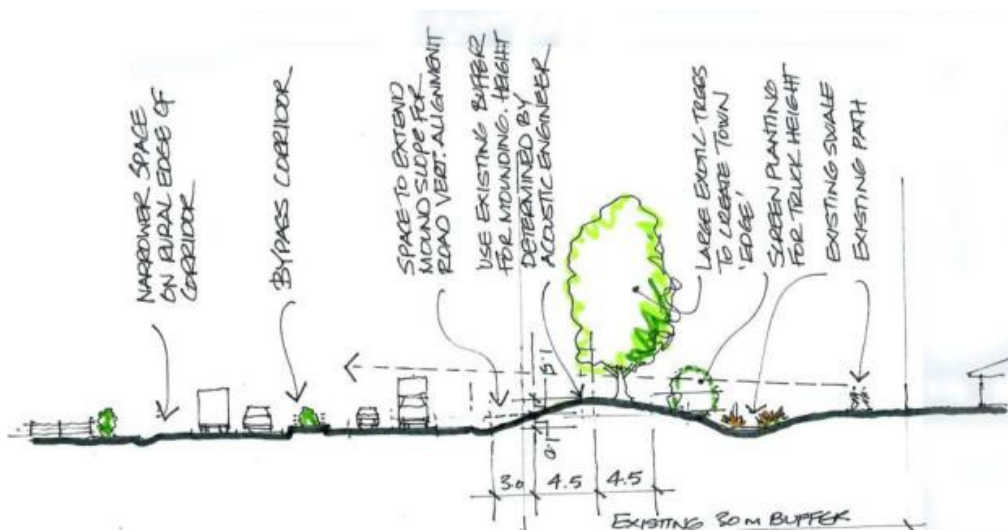


Figure 7: Cambridge North Cross Section concept drawing

Large trees are a safety issue on 100km/hr roads so need separation distance from the carriageway. Noise walls should be a last resort as they will further detract from the buffer open space and the bypass' rural driving experience. Therefore mounds are a better option as they avoid noise walls and provide a safety buffer from the carriageway. However the mounds require shallow slopes to allow grass/plants to establish and therefore take up more width.

Figure 8 is based on a 1.5 metre high mound but this height will be determined by an acoustic engineer. Along state highway corridors an 810mm high TL4 concrete barrier is usually sufficient to meet acoustic standards, so a 1.5 metre mound seems a reasonable assumption at this stage. A 1.5 metre high mound requires 9 metres in width allowing for a 1:3 planting slope. The Cambridge Bypass carriageway also needs to rise and fall to create slope for stormwater collection so the section allows another 3 metres width. Therefore mounds could require approximately 12 metres corridor width. This roughly equates to the flat grassed area in the existing landscape buffer.

The 'town edge' tree line can be planted on top or just over the top of the mound for vehicle safety. The important feature from an urban design perspective is that this forms a strong linear element to contrast with the rural landscape on the opposite side of the corridor.

There is the potential for the 'town edge' tree line to extend into tree planting that defines the edge roads for the 'town belt' but this decision lies with Waipa District Council.

Any urban development on the northern boundary of the Bypass route should be required to allow for a 30 metre buffer and implement mounding and tree planting matching the southern boundary.

The Cambridge North Structure Plan shows the landscape buffer extending across the Swayne Road overbridge. Continuing the swale and footpath across this alignment will have to be considered in the design by Transit and Waipa District Council. Climbing up the overbridge embankment is not practical for cycling, and a detour away to where the embankment returns to ground level is not convenient for walking and cycling. The direct at-grade route is below the overbridge but this will require a longer span and probably a spill through abutment to create a more open footpath area.

A half-up/half-down arrangement appears the best option at Thornton Road. Placing the local road on a half-up overbridge reduces the embankment height and therefore reduces access severance to houses and visual effects. Placing the Bypass in a half-down trench reduces noise and visual effects to neighbouring properties. The 'town edge' tree planting should extend over Thornton Road to the Karapiro Stream gully.



HAUTAPU SECTION

Existing Conditions

Other than views from Hannon & Peake Roads the Hautapu Section is hard to inspect as it lies on private property. Based on examination of aerial photographs and the lack of scheduled items in the District Plan there does not appear to any significant effects with the proposed alignment. The Cambridge Jockey Club and associated facilities stretch along the southern boundary from Hannon to Peake Road.

Future changes are more important along the northern boundary with the proposed Hautapu Industrial Zone (Figure 8). The structure plan includes a buffer along the Bypass route containing a swale and pedestrian/cycling route.

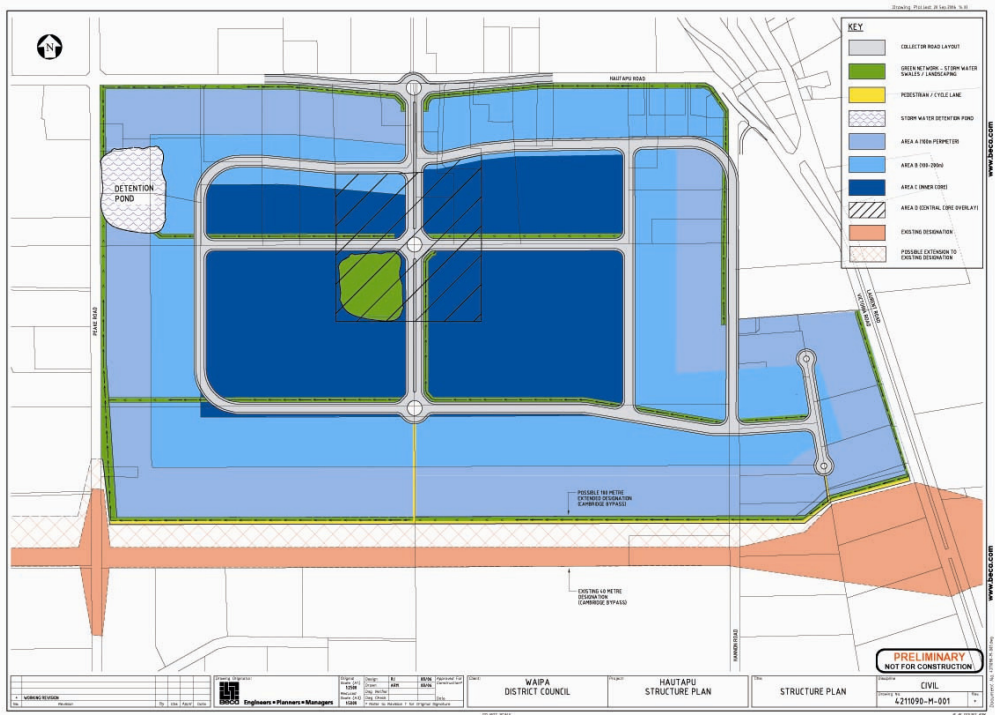


Figure 8: Hautapu Structure Plan

Design Issues

The tree planting proposed for Cambridge North should extend along southern edge of the Hautapu Section to further define the 'town edge'. The stormwater swale and cycle/pedestrian footpath in the Cambridge North landscape buffer (Figure 4) should be extended in the future urban area between Victoria & Hannon Roads. The swale and footpath are best left as part of the subdivision requirements vested to Waipa District Council. Construction of the mounds and planting can be part of the Cambridge Bypass if it predates the subdivision.

There does not appear to be any point in extending the cycle/pedestrian footpath past the Cambridge Jockey land unless it forms part of a wider regional plan. Mounds rather than noise walls are the preferable acoustic mitigation measure to maintain a consistent visual character along the Cambridge Bypass.

The two road edges are treated differently in the Cambridge North Section to reflect the urban and rural context. The future warehouses or industrial plant in the Hautapu Industrial Zone present a different design context. For example the 'town edge' trees can be planted on both sides to reflect urban landuse on both sides of the Hautapu Section, or different planting on the northern side can leave the 'town edge' planting consistently on the southern edge along the whole bypass length.

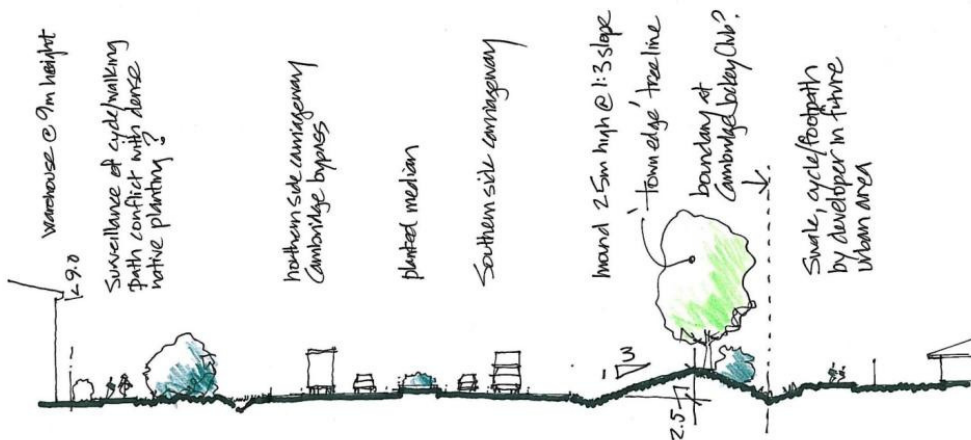


Figure 9: Hautapu Section cross section

The latter option of different planting may suit the different buildings on each side of the Cambridge Bypass. Houses in the residential neighbourhoods are two storey's high at most so views between the 'town edge' trees is one of Cambridge's roofscapes. The blank rear walls of warehouses or storage yards are not so attractive so planting should be denser to block views from the bypass. Warehouses can commonly be 12 metres high so the design of the screening planting will need to take this into account.

The problem with the dense planting is that it will create an unsafe cycling and pedestrian paths proposed in the Hautapu Industrial Zone Structure Plan (Figure 8). Unless these paths extend further along the Waikato Expressway relocating these paths into the industrial zone's internal streets may be better.

Waipa District Council staff has suggested a bridle path on the Peake Road overbridge for access to the racing track. Many trainers ride from the local road area and with Hannon Road being severed, Peake Road becomes the best access route. This could be integrated with Waipa District Council's proposals for a bridle path along Peake Road.



VICTORIA ROAD INTERCHANGE

EXISTING CONDITIONS

At the point where the proposed bypass crosses Victoria Road the land is flat with no significant heritage elements. Landuse is farming or service type light industrial (Figures 9 & 10). This belies the areas future importance as Cambridge's new northern entrance. The most important existing feature is the railway designation that lies between Victoria and Laurent Roads (visible in Figure 10). Maintaining clear access for rebuilding the railway is a major constraint on the interchange ramp design.



Figure 10: Looking west from Victoria Road along the proposed alignment



Figure 11: Looking east from Victoria Road along the proposed alignment

DESIGN ISSUES

The concept for a 'town edge' tree line came from the possibility of streetscaping Victoria Road as the main entry to Cambridge. A boulevard of oak or plane trees could extend down Victoria Road and fan out along the southern edge of the Cambridge Bypass.

A diamond ramp interchange (Figure 12) is preferable from an urban design perspective as the trees could extend along the southern ramps maintain a linear arrangement connecting the bypass and Victoria Road visually. However this appears difficult to achieve as ramp intersections on Victoria Road will cross Laurent Road and the rail designation affecting access to rebuild the railway.

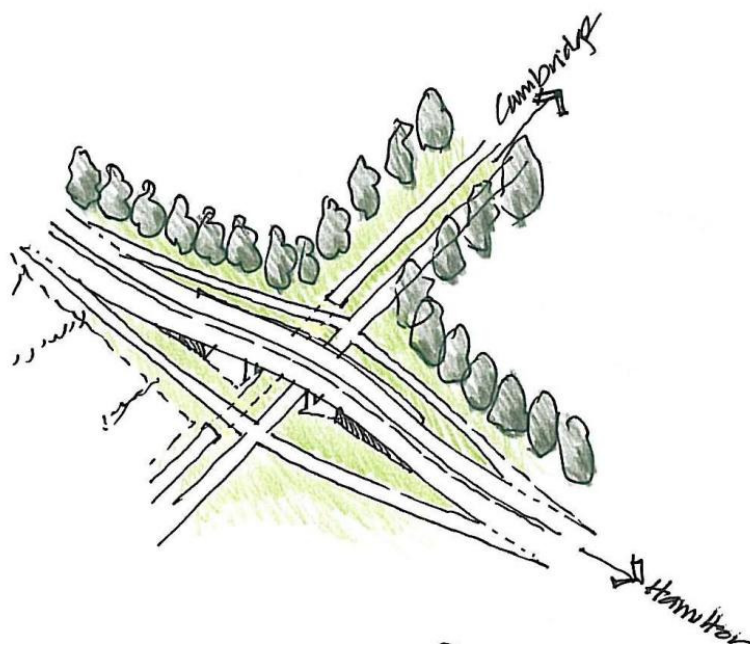


Figure 12: Diamond interchange option

A **paclo** interchange avoids crossing the rail designation by using a 'half-cloverleaf' type interchange so all access is from the western side of Victoria Road. This type of interchange is much wider so the connecting tree lines will be more curved following the ramp alignments on one side but in a linear arrangement on the eastern side. Options need to be evaluated in the design phase but the wider interchange will be a weaker gateway type design.

Comment [ArBD1]: George have I got this term right?

One more radical suggestion would have to be supported by Waipa District Council. Traffic volume on Victoria Road will increase with the bypass, and may require extra lanes. Combining Victoria and Laurent Roads into one road with separate direction carriageways on each side of the 'rail median' will afford greater capacity without widening. Intersection layouts and 'U' turning facilities would have to be examined. Ramps from a diamond interchange could exit on to roundabouts to each side of the bypass alignment.

This integrates Laurent Road into a solution but leaves the rail corridor unsolved. Detailed design is required to see if there is a solution for the railway access. Risk assessment of the cost of grade separating a railway line under the interchange is encourages. Although very expensive the reintroduction of a railway service to Cambridge appears unlikely given the town's population. The negative with roundabouts is the access difficulties they create for cyclists and pedestrians. Waipa District Council wants to see provision for walking/cycling connections to the Hautapu industrial area. Signalised intersections are best for walking/cycling crossing.

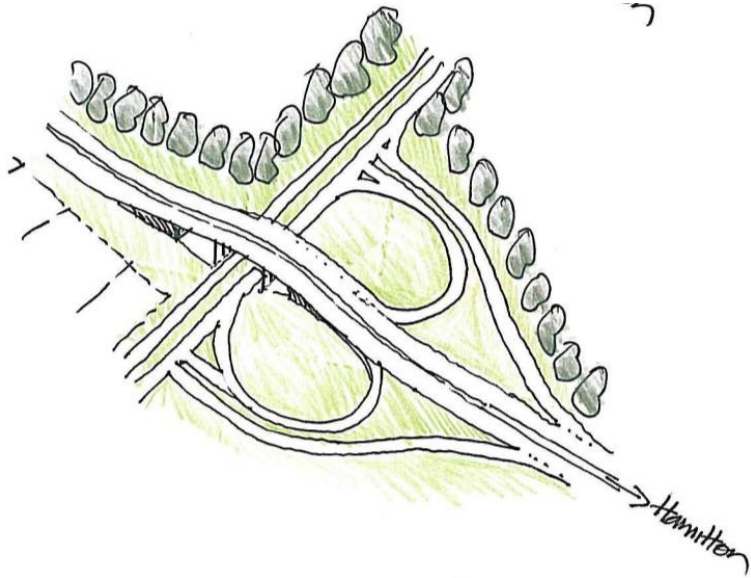


Figure 13: Paolo interchange option

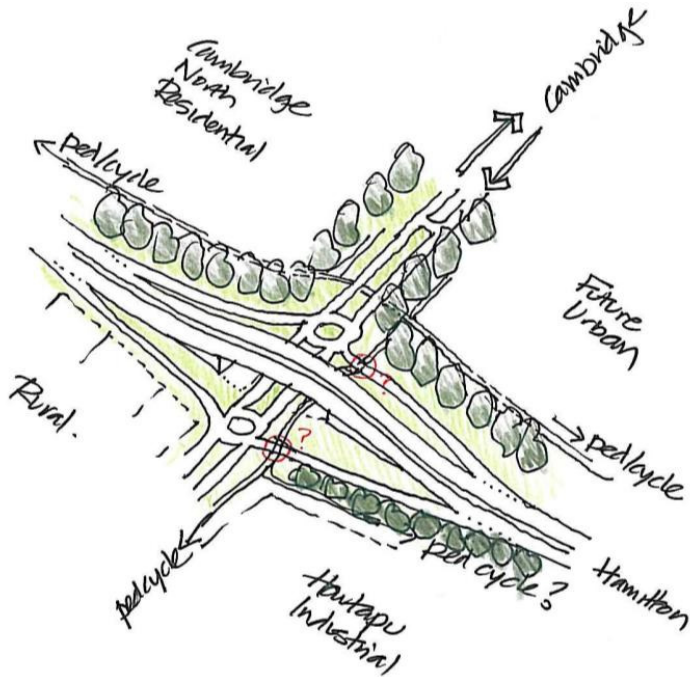


Figure 14: Combine Victoria/Laurent Road option

BRIDGE AND ROADSIDE ELEMENTS

To be developed.

SUMMARY

1. The Cambridge Bypass is conceived as a Second Town Belt to create a positive urban edge for the town.
2. Landscape design could extend Cambridge's streetscape tree planting along Victoria Road and the Cambridge Bypass to reinforce the 'Town of Trees' image as a consistent corridor theme. Victoria Road will become the main northern entrance to Cambridge.
3. An asymmetric planting design responds to an urban edge on the southern side of the corridor, and rural/industrial edges on the northern side.
4. Denser native (evergreen) planting could be considered to screen the less attractive Hautapu industrial zone.
5. Mounds are preferable to noise walls for acoustic mitigation. Locating the mounds outside the existing swale/footpath buffer area appears possible in the Cambridge North Section. This buffer and footpaths should extend along the future urban area between Hannon and Victoria Roads.
6. Walking/cycling paths beside the Hautapu Industrial zone will have surveillance problems if denser planting is preferred. These could be relocated to internal roads if the visual screening is considered more important.
7. A diamond interchange is preferred from an urban design perspective but it causes problems with the rail designation along Victoria Road.
8. Karapiro Stream Gully and project areas outside the sections in this report are rural in character so are covered in the Landscape Architect's assessment.

REFERENCED DOCUMENTS

- Cambridge North Deferred Residential Zone Structure Plan
Prepared by Tonkin & Taylor for Waipa District Council, February 2004.
- Waipa Urban Growth Strategy, November 2003, Waipa District Council.
- Central Cambridge Character Area Design Guidelines, Waipa District Plan
- Transit Urban Design Implementation Principles