

Appendix G

Transport Strategy Assessment of Environment Effects (AEE)

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Transportation Study***

***Transport Strategy – Assessment of
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1. Introduction

Preliminary assessments of environmental effects (AEEs) were produced for each option of the Strategy in the *Options Analysis Report – December 2005*, and for the Draft Transport Strategy for Consultation and each corridor and growth area within the same in the *Draft Transport Strategy Interim Assessment Report – September 2006*.

The present AEE for the Transport Strategy provides both an assessment of the Strategy as a whole and each corridor and growth area. Areas of interest identified in the *Christchurch Rolleston and Environs Consultation Report – March 2007* are highlighted to indicate which issues have already gained public attention.

Comprehensive AEEs will be produced for individual projects at an appropriate time, such as the scheme assessment stage. We anticipate that specialist reports will be produced at the time if required, such as ecological surveys and visual assessments.

A summary table of the potential environmental effects which will require investigation at the scheme assessment stage is provided on the following page. The table covers the Transport Strategy and each corridor and growth area.

Summary Table

	Existing/Potential Land Uses	Designations	Property Access Severance	Landscape Characteristics/Quality	Mitigation of Effects on Landscape	Geological/Geotechnical Considerations	Drainage	Noise	Maori, Archaeological, Cultural and Heritage Sites	Social Severance and Property Severance	Public Transport/Cycle
Transport Strategy	X	X	X	x	X	X	X	X	X	X	X
Christchurch Southern Access Corridor Summary	X	X	X	X	X	X		X	X	X	X
Belfast to Hornby Corridor Summary	X	X	X	X	X	X	X	X	X	X	X
Russley to Aylesbury Corridor											
Hornby to Burnham Corridor	X	X	X	X	X	X		X		X	X
Christchurch to Lincoln Corridor including Prebbleton	X	X		X	X	X	X	X	X	X	X
Christchurch to Tai Tapu Corridor	X	X	X	X	X	X		X		X	X
Christchurch Outer Suburbs & South Western Orbital Corridor	X	X		X	X	X	X	X	X	X	X
Rolleston to Lincoln Corridor											
Christchurch International Airport	X	X	X	X	X	X	X	X	X	X	X
Templeton Township											
Rolleston Township and Industrial Area	X	X	X	X	X	X		X		X	X
Lincoln Township	X	X		X	X	X	X	X	X	X	X
Springston Village											

X
X

Effect relevant

Effect relevant & gained public attention during 2006 consultation

2. Transport Strategy

Existing/potential land uses: The Transport Strategy affects existing roading corridors and also involves the creation of new roads. The existing roading corridors adjoin a range of different land uses from servicing townships and schools, university and research institutions, quarrying, industrial and service activities, the Christchurch International Airport, residential and rural residential activities, recreation activities, and rural farming activities. The new roads outlined in the Transport Strategy principally affect rural and rural-residential land uses. The purchase of significant amounts of rural land will be necessary for these new roads. Some residential land will be required near Halswell and Lincoln. Recent rural-residential developments, such as the Claremont Subdivision near the intersection of State Highway 1 and Dawsons/Waterholes Road will require any new roads adjoining them to be aligned and constructed in a manner that minimises any adverse effects as much as practicable.

Designations: Designations will be required for new roads, road widening, and to upgrade intersections. There is an existing Christchurch City Council designation for the realignment of Wigram Road and designations for the widening of State Highway 1. Important new designations will be required to establish new roads for:

- Widening for a service lane for Whincops Road between Halswell Junction Road and Quaifes Road
- Southern Motorway extension from Halswell Junction Road to State Highway 1
- A link between Trices Road and Candys Road
- The Lincoln southern bypass/collector *
- Realignment of Pound Road at Barthers/Waterloo Road
- State Highway 1 / Weedons Road Interchange
- Bryon Street Extension
- Hoskyns Road and Rolleston Drive connection and intersections
- Tennyson Street / Brookside Road connection with service lane

* Portions of this may occur through subdivision development over time not requiring designations to be put in place, as also expected for the proposed collector road south of Rolleston.

Property access severance: This will be an issue principally affecting State Highway 1 and Halswell / Lincoln Roads with the construction of a four-lane median divided road. Existing properties will join the highway in one direction and cross movement will be limited to the main intersections. For safety reasons, the LAR status will be extended so as to cover State Highway 1 from Dawsons/Waterholes Road to Rolleston and also the new section of the Southern Motorway extension. Changes to roading hierarchies may seek to consolidate access onto key arterial routes and avoid the creation of new access where possible.

Landscape characteristics/quality: The study area is flat terrain consisting predominantly of grassed open farmland, rural-residential allotments, scattered buildings, some shelterbelts and trees and Christchurch. The Transport Strategy involves widening existing roads, establishing new roads, and constructing new structures like grade separated interchanges and roundabouts that will create local adverse visual effects. The Transport Strategy will also require the removal or relocation of existing landscape features such as trees and vegetation, fencing, lighting and power poles, as well as introducing them.

Mitigation of effects on landscape: To ensure that the roading will be integrated into the existing environment those sections of State Highways and local authority roading will be suitably landscaped

where appropriate, as will the intersections that are proposed to be closed. Design and landscaping will assist in mitigating some of the adverse effects arising from the establishment of the new roads.

Geological/geotechnical considerations: There is the possibility of the presence of filled pits in the area between the Halswell Junction Road/Springs Road intersection and the Marshs Road/Shands Road intersection. This would require further detailed investigation. New roads, widening, and changes at intersections will require detailed geotechnical investigations during the design phase of roading improvements. This is particularly important when establishing new structures such as those at grade separated interchanges.

Drainage: The parts of the study area where drainage is a particularly important consideration include new roads or roading improvements that pass over or are near to the tributaries of the Halswell River and near to the Halswell River itself.

Noise: There will be temporary noise effects during the construction phase. New roads will introduce vehicle noise from high-volume traffic flows to some presently quiet areas, most notably in the case of the Southern Motorway extension. Other roading improvements will facilitate higher traffic volumes with a consequent rise in traffic-generated noise or increased noise levels at the notional boundaries of existing dwellings by bringing vehicle paths closer to existing dwellings. An increase in traffic-generated noise is to be expected, given existing roading designations, the purpose of which is to cater for growing traffic volumes. Increases in traffic-generated noise levels on the new portions of road can be mitigated in areas of higher density residential use through the employment of buffers or barriers.

Maori, archaeological, cultural and heritage sites: There is a historic waka path on Owaka Road of significance to Ngai Tahu, a historical marker on Russley Road near Ryans Road, and remnant dry grasslands near Wigram Hotmix Plant (ecological heritage area 11.05 in the Operative Christchurch City Plan). There are no other known sites of Maori, cultural, historical or archaeological significance affected by the Strategy. However, the following waterways and the areas surrounding these which could be affected by the Strategy will be of interest to Ngai Tahu:

- the Halswell River and its tributaries such as Knights Stream
- the Styx River and its tributaries
- the tributaries of the Heathcote River
- the LII Stream

Social severance and property severance: The Transport Strategy seeks to minimise social severance within settlements by ensuring existing links are maintained while new roads bypass settlements. At some intersections it is proposed that road links be closed to provide priority to key arterial routes. New roads will lead to the separation of land that is currently in the same ownership or otherwise provide a barrier between neighbours. This is particularly the case for rural and rural-residential properties to be separated by the Southern Motorway extension. There will be considerable adverse social effects for the affected owners and occupiers. There will be realignments at some intersections, the Longstaffs Road/Whincops Road intersection will be closed, and Trents Road will be closed where the proposed Southern Motorway extension crosses it.

Public transport/cycle: The more efficient highway and roading network will enable public transportation to operate more efficiently. There will also be opportunities to provide for separate cycle lanes or at least improvements to the shoulders of existing carriageways to establish cycling routes between townships and also to Christchurch city.

Consultation to date: The following topics were raised in the consultation process undertaken in 2006:

- Access
- New roads, including increases in noise
- Recreational uses
- Public transport
- Timing of implementation
- Cycling
- Business impacts
- Ecological impacts

Specific issues or sites within these categories are discussed in the following chapters which address each corridor and growth area.

3. Christchurch Southern Access Corridor Summary

Existing/potential land uses: The Christchurch Southern Access Corridor element of the Transport Strategy involves the creation of new roads. The proposed roading alignment for the Motorway Extension adjoins industrial, service, and rural activities. The new road alignment (being an extension of the Southern Motorway) principally affects rural and rural-residential land uses, and the purchase of a significant amount of rural land will be necessary for the new road. Recent rural-residential developments, such as near the intersection of State Highway 1 and Dawsons/Waterholes Road, may require the new road to be aligned around them.

Designations: Designations will be required for the new roads, road widening, and to upgrade intersections. A Deed of Grant will also be required from ONTRACK for a new railway crossing for the new road link between Washbournes Road and Epsom Road.

Property access severance: As the Southern Motorway Extension involves the creation of a new road, no existing vehicle crossings will be severed. However, as the alignment cuts through properties, some access ways may be severed. For safety reasons, a LAR status will be applied to the new section of the Southern Motorway extension. Changes to the roading layout may seek to consolidate access onto key arterial routes and avoid the creation of new accesses where possible.

Landscape characteristics/quality: In respect of the Southern Motorway Extension, the study area is flat terrain consisting predominantly of grassed open farmland, rural-residential allotments, scattered buildings, some shelterbelts and trees. This element of the Strategy involves establishing a new road and constructing new structures, including grade separated interchanges that will create local adverse visual effects. The Strategy will also require the removal or relocation of existing features in the landscape such as trees and vegetation, dwellings, non-residential buildings, fencing, lighting and power poles.

Mitigation of effects on landscape: To ensure that the roading will be integrated into the existing environment, areas of roading improvements will be suitably landscaped where appropriate, as will the Trents Road intersection that is to be closed. Design and landscaping will assist in mitigating some of the adverse effects arising from the establishment of the new roads. However such measures will have limited positive impacts on raised structures such as interchanges and overpasses, which due to the flat nature of the terrain will change the local landscape of the affected areas.

Geological/geotechnical considerations: There is the possibility of the presence of filled pits in the area between the Halswell Junction Road/Springs Road intersection and the Marshs Road/Shands Road intersection. This would require further detailed investigation. The new roads and changes at intersections will require detailed geotechnical investigations during the design phase of roading improvements. This is particularly important when establishing new structures such as those at grade separated interchanges.

Drainage: There are no sensitive waterbodies within the vicinity of the land affected by this element of the strategy.

Noise: There will be temporary noise effects during the construction phase. In respect of the Southern Motorway Extension, new roads will introduce varying levels of vehicle noise to properties that are currently distant from high-volume traffic flows. Increases in traffic-generated noise levels on the new portions of road can be mitigated in areas of higher density residential use, such as the rural-residential development near the intersection of State Highway 1 and Dawsons/Waterholes Road through the employment of buffers or barriers.

In respect of the Sockburn roundabout, the new roads will bring vehicle noise marginally closer to some buildings, however, given the commercial nature of the land uses, this is not anticipated to be a significant matter. Other roading improvements could facilitate higher traffic volumes with a consequent rise in traffic-generated noise, however if the other nearby works identified in the Strategy are carried out, traffic volumes will decrease in the area in question. An increase in traffic-generated noise is to be expected on routes with existing roading designations, the purposes of which are to carry traffic.

Maori, archaeological, cultural and heritage sites: There is a historic waka path on Owaka Road of significance to Ngai Tahu. It is recommended that further consultation with the relevant parties be undertaken at a more appropriate time such as the scheme assessment stage. There are no other known sites of Maori, cultural, historical or archaeological significance affected by the Strategy.

Social severance and property severance: The Strategy seeks to minimise social severance within settlements by ensuring existing links are maintained while new roads bypass settlements. The potential removal of some dwellings and/or reduction of the size of properties are likely to have significant adverse social effects for affected owners and occupiers. At the Trents Road intersection it is proposed that the road links be closed to provide priority to the Southern Motorway, causing disruption for persons who presently utilise this section of road. New roads will lead to the separation of land that is currently in the same ownership or otherwise provide a barrier between neighbours. There will be considerable adverse social effects for the affected owners and occupiers, in particular the Christchurch City Council which will see its Sockburn Service Centre site divided into two parts.

Public transport/cycle: The improved highway and roading network will enable public transportation to operate more efficiently. Given the high speed environment, no cycling will be allowed on the motorway extension beyond Halswell Junction Road. In respect of the Sockburn roundabout, there may be opportunities to provide for separate cycle lanes or at least improvements to the shoulders of the carriageway and footpaths.

Consultation to date: The following topics were raised in the consultation process undertaken in 2006:

- New roads: Several submissions were received raising concerns about the effects of the proposed alignment on the Claremont subdivision.

4. *Belfast to Hornby Corridor Summary*

Existing/potential land uses: The Belfast to Hornby Corridor element of the Transport Strategy utilises existing roads as well as involving the creation of new roads. The existing roads adjoin a range of different land uses including quarrying, industrial and service activities, the Christchurch International Airport, residential, recreation and rural activities. The new road links at the Pound Road/Barters Road intersection will affect rural and rural-residential land uses. The purchase of some rural land will be necessary for the new road links.

Designations: Designations will be required for new roads, road widening, and to upgrade intersections. There is an existing designation for the widening of State Highway 1 along Russley and Johns Roads. A new designation will be required to establish a new road at the Pound Road/Barters Road intersection.

Property access severance: This will be an issue principally affecting State Highway 1 with the construction of a four-lane median divided road. Existing properties will have access to the highway in one direction only and cross movement will be limited to the main intersections and u-turn slots. For safety reasons, a LAR status will be applied to the section of Pound Road included in the Strategy.

Landscape characteristics/quality: The study area is flat terrain consisting predominantly of grassed open farmland, residential and rural-residential allotments, scattered buildings, some shelterbelts and trees, urban Christchurch, and Christchurch Airport. The Strategy involves widening existing roads, establishing new roads, and constructing new structures like grade separated interchanges and roundabouts that will create local adverse visual effects. The Strategy will also require the removal or relocation of existing features in the landscape such as trees and vegetation, dwellings, and other buildings, fencing, lighting and power poles.

Mitigation of effects on landscape: To ensure that the roading will be integrated into the existing environment, areas of roading improvements will be suitably landscaped where appropriate, as will the intersections that are to be closed. Design and landscaping will assist in mitigating some of the adverse effects arising from the establishment of the new roads, however such measures will have limited positive impacts on raised structures such as interchanges and overpasses, which due to the flat nature of the terrain will change the local landscape of the affected areas.

Geological/geotechnical considerations: New roads, widening, and changes at intersections will require detailed geotechnical investigations during the design phase of roading improvements. This is particularly important when establishing new structures such as those at grade separated interchanges.

Drainage: There is a waterbody within the vicinity of the site which runs from the nearby Templeton Country Club. The roads subject to this element of the strategy also pass over or near to the Styx River, Waimairi Creek, and Heathcote River.

Noise: There will be temporary noise effects during the construction phase. The roading improvements will facilitate higher traffic volumes with a consequent rise in traffic-generated noise or increase noise levels at the notional boundaries of existing dwellings by bringing vehicle paths closer to existing dwellings. An increase in traffic-generated noise is to be expected on routes with existing roading designations, the purposes of which are to carry traffic. The new portion of road at the Pound Road/Barters Road intersection will take vehicle paths further from the existing dwellings, leading to a possible reduction in vehicle noise at the notional boundaries of these dwellings, although the higher traffic volumes may offset this reduction.

Maori, archaeological, cultural and heritage sites: There is a historical marker on Russley Road near Ryans Road, and remnant dry grasslands near Wigram Hotmix Plant (ecological heritage area

11.05 in the Operative Christchurch City Plan). The Styx River and its tributaries, the tributaries of the Heathcote River, and the surrounding area are well known as significant sites and areas to Ngai Tahu. Therefore, it is recommended that further consultation with the relevant parties be undertaken at a more appropriate time such as the scheme assessment stage. There are no other known sites of Maori, cultural, historical or archaeological significance affected by this element of the Strategy.

Social effects, social severance and property severance: This element of the Strategy seeks to minimise social severance within settlements by ensuring existing links are maintained. At some intersections it is proposed that road links be closed to provide priority to key arterial routes. The new roads will lead to the separation of land that is currently in the same ownership or otherwise provide a barrier between neighbours. The Pound Road realignment can be designed to minimise property severance, however, there will be adverse social effects for the affected owners and occupiers. The closure of some intersections, such as Wairakei Road, will cause disruption for persons who presently utilise these intersections.

Public transport/cycle: The improved highway and roading network will enable public transportation to operate more efficiently. There may also be opportunities to provide for separate cycle lanes or at least improvements to the shoulders of the carriageway and footpaths.

Consultation to date: No topics were raised in the consultation process undertaken in 2006 which specifically affect this element of the Strategy, although general matters such as public transport, cycling, access to businesses and noise effects may be of relevance.

5. *Russley to Aylesbury Corridor*

Environmental effects: As no works are proposed for this element of the Strategy, no assessment of social and environmental effects is necessary.

Consultation to date: No topics were raised in the consultation process undertaken in 2006 which specifically affect this element of the Strategy.

6. *Hornby to Burnham Corridor*

Existing/potential land uses: The Hornby to Burnham Corridor element of the Strategy utilises existing roads, which adjoin residential activities and rural activities. The new roads outlined in the Strategy principally affect rural and rural-residential land uses. The purchase of land will be necessary for some of the upgraded intersections.

Designations: Designations will be required to upgrade some of the intersections. There is an existing designation for the widening of State Highway 1.

Property access severance: This will be a significant issue arising from the construction of a four-lane median divided road. Existing properties will have access to the highway in one direction only and cross movement will be limited to the main intersections.

Landscape characteristics/quality: The study area is flat terrain consisting predominantly of grassed open farmland, residential and rural-residential allotments, scattered buildings, some shelterbelts and trees. The Strategy involves widening existing roads and constructing new structures like grade separated interchanges that will create local adverse visual effects. The Strategy will also require the removal or relocation of existing features in the landscape such as trees and vegetation, buildings, fencing, lighting and power poles.

Mitigation of effects on landscape: To ensure that the roading will be integrated into the existing environment areas of roading improvements will be suitably landscaped where appropriate, as will the intersections that are to be closed. Design and landscaping will assist in mitigating some of the adverse effects arising from the establishment of the new roads. However such measures will have limited positive impacts on raised structures such as interchanges and overpasses, which due to the flat nature of the terrain will change the local landscape of the affected areas.

Geological/geotechnical considerations: Road widening and changes at intersections will require detailed geotechnical investigations during the design phase of roading improvements. This is particularly important when establishing new structures such as those at grade separated interchanges.

Drainage: There are no sensitive waterbodies within the vicinity of the land affected by this element of the strategy.

Noise: There will be temporary noise effects during the construction phase. The roading improvements will facilitate higher traffic volumes with a consequent rise in traffic-generated noise or increase noise levels at the notional boundaries of existing dwellings by bringing vehicle paths closer to existing dwellings. An increase in traffic-generated noise is to be expected on routes with the existing roading designation, the purpose of which is to carry traffic.

Maori, archaeological, cultural and heritage sites: There are no known sites of Maori, cultural, historical or archaeological significance affected by this element of the Strategy.

Social effects, social severance and property severance: At some intersections it is proposed that road links be closed or restricted to left in/left out access only, to provide priority to key arterial routes. The closure of some intersections will cause disruption for persons who presently utilise these intersections.

Public transport/cycle: The improved highway and roading network will enable public transportation to operate more efficiently. There may also be opportunities to provide for separate cycle lanes or at least improvements to the shoulders of the carriageway and footpaths. A Park and Ride facility at Rolleston utilising bus services has also been identified.

Consultation to date: No topics were raised in the consultation process undertaken in 2006 which specifically affect this element of the Strategy, although general matters such as public transport, cycling, access to businesses and noise effects may be of relevance.

7. *Christchurch to Lincoln Corridor including Prebbleton*

Existing/potential land uses: The Christchurch to Lincoln Corridor element of the Transport Strategy utilises existing roads as well as involving the creation of new roads. The existing roads adjoin a range of different land uses from industrial and service activities, residential, recreational and rural activities. The new roads outlined in this element of the Strategy principally affect rural and rural-residential land uses. The purchase of significant amounts of rural land will be necessary for these new roads. Recent rural-residential developments may require new roads to be aligned around them to minimise adverse social effects.

Designations: Designations will be required for new roads, road widening, and to upgrade intersections, including an important new designation to establish new roads for a link between Whincops Road and Halswell Junction Road and the Magdala – Wigram connection.

Property access severance: Changes to roading hierarchies will seek to consolidate access onto key arterial routes and avoid the creation of new accesses where possible.

Landscape characteristics/quality: The study area is flat terrain consisting predominantly of grassed open farmland, rural-residential allotments, scattered buildings, some shelterbelts and trees. The Strategy involves widening existing roads, establishing new roads, and constructing new structures like roundabouts that will create local adverse visual effects. The Strategy will also require the removal or relocation of existing features in the landscape such as trees and vegetation, dwellings and other buildings, fencing, lighting and power poles.

Mitigation of effects on landscape: To ensure that the roading will be integrated into the existing environment areas of roading improvements will be suitably landscaped where appropriate, as will the intersections that are to be closed. Design and landscaping will assist in mitigating some of the adverse effects arising from the establishment of the new roads, however such measures will have limited positive impacts on raised structures such as the overpass/underpass at Curletts Road, which due to the flat nature of the terrain will change the local landscape of the affected area.

Geological/geotechnical considerations: New roads, widening, and changes at intersections will require detailed geotechnical investigations during the design phase of roading improvements. This is particularly important when establishing new structures such as overpasses/underpasses.

Drainage: The new road link will pass over or near to several waterways which are tributaries to the Halswell River.

Noise: There will be temporary noise effects during the construction phase. New roads will introduce vehicle noise currently distant from high-volume traffic flows. Other roading improvements will facilitate higher traffic volumes with a consequent rise in traffic-generated noise or increase noise levels at the notional boundaries of existing dwellings by bringing vehicle paths closer to existing dwellings. An increase in traffic-generated noise is to be expected on routes with existing roading designations, the purpose of which is to carry traffic. Increases in traffic-generated noise levels on the new portions of road can be mitigated in areas of higher density residential use through the employment of buffers or barriers.

Maori, archaeological, cultural and heritage sites: There are no known sites of Maori, cultural, historical or archaeological significance affected by the Strategy. However, the Halswell River, its tributaries such as Knights Stream and the surrounding area are well known as significant sites and areas to Ngai Tahu. Therefore, it is recommend that further consultation with the relevant parties be undertaken at a more appropriate time such as the scheme assessment stage.

Social effects, social severance and property severance: This element of the Strategy seeks to minimise social severance within settlements by ensuring existing links are maintained while new roads bypass settlements. The potential removal of some dwellings and/or reduction of the size of properties will have adverse social effects for affected owners and occupiers. At some intersections it is proposed that road links be closed to provide priority to key arterial routes. New roads will lead to the separation of land that is currently in the same ownership or otherwise provide a barrier between neighbours. There will be considerable adverse social effects for the affected owners and occupiers.

Public transport/cycle: The improved highway and roading network will enable public transportation to operate more efficiently. There may also be opportunities to provide for separate cycle lanes or at least improvements to the shoulders of the carriageway and footpaths. By creating a clearer hierarchy of roads, traffic travelling between Christchurch and Lincoln will be encouraged to utilise Ellesmere Road and Shands Road, thereby reducing the level of use of other roads like Springs Road and Birchs Roads making them more suitable for alternative travel modes such public transport and cycling.

Consultation to date: The following topics were raised in the consultation process undertaken in 2006:

- New roads, including increases in noise. Strong opposition to the use of Fountains Road as an arterial route led the Management Team to redesign this route so as to utilise Whincops Road instead as it is an arterial road already. This could result in Whincops Road residents taking a greater interest in the projects associated with this element.
- Ecological impacts around the Fountains Road area. Again the use of Whincops road instead may decrease levels of public concern regarding this potential effect.

8. Christchurch to Tai Tapu Corridor

Existing/potential land uses: The Christchurch to Tai Tapu Corridor element of the Transport Strategy utilises existing roads as well as involving the creation of a new roading link at the Hendersons Road/Halswell Road intersection. The existing roads adjoining land uses range from residential, recreation and rural activities. The new roads outlined in the Strategy principally affect rural and rural-residential land uses. The purchase of some rural land will be necessary for the new road. Recent rural-residential developments may require new roads to be aligned around them to minimise adverse social effects.

Designations: Designations will be required for the new roading link between Hendersons Road and Halswell Road and to upgrade intersections.

Property access severance: This will be an issue with the construction of a four-lane median divided road. Existing properties will have access to the highway in one direction only and cross movements will be limited to the main intersections and u-turn slots. Changes to roading hierarchies will seek to consolidate access onto key arterial routes and avoid the creation of new accesses where possible.

Landscape characteristics/quality: The study area is flat terrain consisting predominantly of residential buildings and grassed open farmland. The relatively minor increases in carriageway widths and intersection improvements over these areas will not result in adverse visual effects of any significance. The Strategy will require the removal or relocation of existing features in the landscape such as trees and vegetation, fencing, lighting and power poles.

Mitigation of effects on landscape: To ensure that the roading will be integrated into the existing environment areas of roading, improvements will be suitably landscaped where appropriate, as will the intersections that are to be closed. Design and landscaping will assist in mitigating some of the adverse effects arising from the establishment of the new roads.

Geological/geotechnical considerations: The new road, widening, and changes at intersections will require detailed geotechnical investigations during the design phase of roading improvements.

Drainage: There are no sensitive waterbodies within the vicinity of the land affected by this element of the strategy.

Noise: There will be temporary noise effects during the construction phase. The new road will introduce vehicle noise to source houses, currently distant from high-volume traffic flows. Other roading improvements will facilitate higher traffic volumes with a consequent rise in traffic-generated noise or increase noise levels at the notional boundaries of existing dwellings by bringing vehicle paths closer to existing dwellings. An increase in traffic-generated noise is to be expected on routes with existing roading designations, the purpose of which is to carry traffic. Increases in traffic-generated noise levels on the new portions of road can be mitigated in areas of higher density residential use through the employment of buffers or barriers.

Maori, archaeological, cultural and heritage sites: There are no known sites of Maori, cultural, historical or archaeological significance affected by the Strategy.

Social effects, social severance and property severance: At some intersections it is proposed that road links be closed or restricted to left in/left out access only to provide priority to key arterial routes. The new section of Hendersons Road will lead to the separation of land that is currently in the same ownership or otherwise provide a barrier between neighbours. There will be considerable adverse social effects for the affected owners and occupiers. The closure or restricted access to some intersections will cause disruption for persons who presently utilise these intersections.

Public transport/cycle: The improved highway and roading network will enable public transportation to operate more efficiently.

Consultation to date: No topics were raised in the consultation process undertaken in 2006 which specifically affect this element of the Strategy, although general matters such as public transport, cycling, access to businesses and noise effects may be of relevance.

9. Christchurch Outer Suburbs & South Western Orbital Corridor

Existing/potential land uses: The Christchurch Outer Suburbs and South Western Orbital Corridor element of the Transport Strategy utilises existing roads as well as involving the creation of new roads. The existing roads adjoin rural land uses. The new roads outlined in this element of the Transport Strategy principally affect rural-residential land uses. The purchase of significant amounts of rural land will be necessary for these new roads.

Designations: Designations will be required for new roads, road widening, and to upgrade intersections, including an important new designation to establish new roads for a link between Trices Road and Candys Road.

Property access severance: Changes to roading hierarchies will seek to consolidate access onto key arterial routes and avoid the creation of new accesses where possible.

Landscape characteristics/quality: The study area is flat terrain consisting predominantly of grassed open farmland, rural-residential allotments, scattered buildings, some shelterbelts and trees. The Strategy involves widening existing roads and establishing new roads. The Strategy will also require the removal or relocation of existing features in the landscape such as trees and vegetation, dwellings and other buildings, fencing, lighting and power poles.

Mitigation of effects on landscape: To ensure that the roading will be integrated into the existing environment areas of roading improvements will be suitably landscaped where appropriate. Design and landscaping will assist in mitigating some of the adverse effects arising from the establishment of the new roads.

Geological/geotechnical considerations: New roads, widening, and changes at intersections will require detailed geotechnical investigations during the design phase of roading improvements.

Drainage: Those parts of the study area where drainage is a particularly important consideration are where new roads or roading improvements pass over or are near to the tributaries of the Halswell.

Noise: There will be temporary noise effects during the construction phase. The new roads will introduce vehicle noise to some houses currently distant from high-volume traffic flows. Other roading improvements will facilitate higher traffic volumes with a consequent rise in traffic-generated noise or increase noise levels at the notional boundaries of existing dwellings by bringing vehicle paths closer to existing dwellings. An increase in traffic-generated noise is to be expected on routes with existing roading designations, the purpose of which is to carry traffic. Increases in traffic-generated noise levels on the new portions of road can be mitigated in areas of higher density residential use through the employment of buffers or barriers.

Maori, archaeological, cultural and heritage sites: There are no known sites of Maori, cultural, historical or archaeological significance affected by the Strategy. However, the Halswell River, its tributaries such as Knights Stream and the surrounding area are well known as significant sites and areas to Ngai Tahu. Therefore, it is recommended that further consultation with the relevant parties be undertaken at a more appropriate time such as the scheme assessment stage.

Social effects, social severance and property severance: The Strategy seeks to minimise social severance within settlements by ensuring existing links are maintained while new roads bypass settlements. The potential removal of some dwellings and/or reduction of the size of properties will have adverse social effects for affected owners and occupiers. New roads will lead to the separation of

land that is currently in the same ownership or otherwise provide a barrier between neighbours. There will be considerable adverse social effects for the affected owners and occupiers.

Public transport/cycle: The improved highway and roading network will enable public transportation to operate more efficiently. There may also be opportunities to provide for separate cycle lanes or at least improvements to the shoulders of the carriageway and footpaths.

Consultation to date: The following topics were raised in the consultation process undertaken in 2006:

- Ecological impacts around the Quaifes Road/Sabys Road area.
- Wish to remove sharp bend at Knights Stream Bridge.

10. Rolleston to Lincoln Corridor

Environmental effects: As the suggested works for this corridor involve upgrading roads and intersections within the existing road reserves, the environmental and social effects will be minor and will fall within what is anticipated by the existing designation. If at the final design stage it becomes apparent that any additional land is required at intersections, the works will be of a minor scale with very localised effects.

Consultation to date: No topics were raised in the consultation process undertaken in 2006 which specifically affect this element of the Strategy, although general matters such as public transport, cycling, access to businesses and noise effects may be of relevance.

11. Christchurch International Airport

Existing/potential land uses: The Christchurch International Airport element of the Transport Strategy utilises existing roads as well as involving the creation of new roads. The existing roads adjoin a range of different land uses from industrial and service activities, the Christchurch International Airport, residential and rural activities. The new roads outlined in this element of the Strategy will be over land owned by Christchurch International Airport Ltd.

Designations: Designations will be required to upgrade intersections. There is an existing designation for the widening of State Highway 1. Most land required for the new roads is owned by Christchurch International Airport Ltd, no designations will be required to establish new roads for Capital A Road and the extension of Ron Guthrey Road. The exception is the section between McLeans Island Road and Sawyers Arms Road where new designations will be required.

Property access severance: This will be an issue principally affecting State Highway 1 with the construction of a four-lane median divided road. Existing properties will have access to the highway in one direction only (left in and left only) and cross movement will be limited to the main intersections.

Landscape characteristics/quality: The study area is flat terrain consisting predominantly of land used for airport purposes, business activities, grassed open farmland, rural-residential allotments, scattered buildings, some shelterbelts and trees. The Strategy involves widening existing roads, establishing new roads, and constructing new structures like grade separated interchanges and roundabouts that will create local adverse visual effects. The Strategy will also require the removal or relocation of existing features in the landscape such as trees and vegetation, buildings, fencing, lighting and power poles.

Mitigation of effects on landscape: To ensure that the roading will be integrated into the existing environment areas of roading improvements will be suitably landscaped where appropriate, as will the intersections that are to be closed. Design and landscaping will assist in mitigating some of the adverse effects arising from the establishment of the new roads, however such measures will have limited positive impacts on raised structures such as interchanges and overpasses, which due to the flat nature of the terrain will change the local landscape of the affected areas.

Geological/geotechnical considerations: New roads, widening, and changes at intersections will require detailed geotechnical investigations during the design phase of roading improvements. This is particularly important when establishing new structures such as those at grade separated interchanges.

Drainage: There are no sensitive waterbodies within the vicinity of the land affected by this element of the strategy. However, the Styx River, its tributaries, and the surrounding area are well known as significant sites and areas to Ngai Tahu. Therefore, it is recommend that further consultation with the relevant parties be undertaken at a more appropriate time such as the scheme assessment stage.

Noise: There will be temporary noise effects during the construction phase. New roads will introduce vehicle noise currently distant from high-volume traffic flows, however, given that these new roads are on land owned by Christchurch International Airport Ltd, the effects will be no more than minor as there are no sensitive activities which would be adversely affected by an increase in traffic-related noise. Other roading improvements will facilitate higher traffic volumes with a consequent rise in traffic-generated noise or increase noise levels at the notional boundaries of existing dwellings by bringing vehicle paths closer to existing dwellings. An increase in traffic-generated noise is to be expected on routes with existing roading designations, the purpose of which is to carry traffic.

Maori, archaeological, cultural and heritage sites: There are no known sites of Maori, cultural, historical or archaeological significance affected by the Strategy. However, the Styx River, its

tributaries and the surrounding area are well known as significant sites and areas to Ngai Tahu. Therefore, it is recommended that further consultation with the relevant parties be undertaken at a more appropriate time such as the scheme assessment stage.

Social effects, social severance and property severance: The majority of the new roads are located on land owned by Christchurch International Airport Ltd, and as such limited property and social severance effects will occur from the establishment of the same. At some intersections it is proposed that road links be closed to provide priority to key arterial routes. The closure of some intersections, such as Avonhead Road and the western airport-side portion of Wairakei Road, will cause disruption for persons who presently utilise these intersections.

Public transport/cycle: The improved highway and roading network will enable public transportation to operate more efficiently. There may also be opportunities to provide for separate cycle lanes or at least improvements to the shoulders of the carriageway and footpaths.

Consultation to date: No topics were raised in the consultation process undertaken in 2006 which specifically affect this element of the Strategy, although general matters such as public transport, cycling, access to businesses and noise effects may be of relevance.

12. Templeton Township

Environmental effects: As no works are proposed for this element of the Strategy, no assessment of social and environmental effects is necessary.

Consultation to date: No topics were raised in the consultation process undertaken in 2006 which specifically affect this element of the Strategy.

13. Rolleston Township and Industrial Area

Existing/potential land uses: This element of the Strategy utilises existing roads as well as involving the creation of a new portion of roading between Byron Street and Rolleston Drive North. The existing roads adjoin land uses from residential, business, and rural activities. The new road links principally affects rural, residential and business land uses, and the purchase of some land used for these activities will be necessary for these new roads. A slip road will be created parallel to State Highway 1 to provide access to the BP petrol station and other businesses.

Designations: Designations will be required for new roads, road widening, and to upgrade intersections. There is an existing designation for the widening of State Highway 1.

Property access severance: This will be an issue principally affecting State Highway 1 with the construction of a four-lane median divided road. Existing properties will have access to the highway in one direction only and cross movement will be limited to the main intersections. Changes to roading hierarchies will seek to consolidate access onto key arterial routes and avoid the creation of new accesses where possible, such as Jones Road and Lowes/Levi Roads in particular.

Landscape characteristics/quality: The study area is flat terrain consisting predominantly of urban buildings, grassed open farmland, rural-residential allotments, scattered buildings, some shelterbelts and trees. The Strategy involves widening existing roads, establishing new roads, and constructing new structures like grade separated interchanges and roundabouts that will create local adverse visual effects. The Strategy will also require the removal or relocation of existing features in the landscape such as trees and vegetation, buildings, fencing, lighting and power poles.

Mitigation of effects on landscape: To ensure that the roading will be integrated into the existing environment, areas of roading improvements will be suitably landscaped where appropriate, as will the intersections that are to be closed. Design and landscaping will assist in mitigating some of the adverse effects arising from the establishment of the new roads, however such measures will have limited positive impacts on raised structures such as interchanges and overpasses, which due to the flat nature of the terrain will change the local landscape of the affected areas.

Geological/geotechnical considerations: This would require further detailed investigation. New roads, widening, and changes at intersections will require detailed geotechnical investigations during the design phase of roading improvements. This is particularly important when establishing new structures such as those at grade separated interchanges.

Drainage: There are no sensitive waterbodies within the vicinity of the land affected by this element of the strategy.

Noise: There will be temporary noise effects during the construction phase. The new roads will bring vehicle noise marginally closer to some buildings, however, given the commercial nature of the land uses, this is not anticipated to be a significant matter. Other roading improvements will facilitate higher traffic volumes with a consequent rise in traffic-generated noise or increase noise levels at the notional boundaries of existing dwellings by bringing vehicle paths closer to existing dwellings. An increase in traffic-generated noise is to be expected on routes with existing roading designations, the purposes of which are to carry traffic. Increases in traffic-generated noise levels on the new portions of road can be mitigated in areas of higher density residential use through the employment of buffers or barriers.

Maori, archaeological, cultural and heritage sites: There are no known sites of Maori, cultural, historical or archaeological significance affected by the Strategy.

Social effects, social severance and property severance: The Strategy seeks to minimise social severance within settlements by ensuring existing links are maintained while new roads bypass

settlements. The potential removal of some buildings and/or reduction of the size of properties will have significant adverse social effects for affected owners and occupiers. At some intersections it is proposed that road links be closed to provide priority to key arterial routes. New roads will lead to the separation of land that is currently in the same ownership or otherwise provide a barrier between neighbours. There will be considerable adverse social effects for the affected owners and occupiers. The closure of some intersections will cause disruption for persons who presently utilise these intersections.

Public transport/cycle: The improved highway and roading network will enable public transportation to operate more efficiently. There may also be opportunities to provide for separate cycle lanes or at least improvements to the shoulders of the carriageway and footpaths on other roads. By creating a clearer hierarchy of roads, traffic will be channelled to identified strategic routes, thereby reducing the level of use of other roads and making the same more suitable for alternative travel modes such as cycling.

Consultation to date: The following topics were raised in the consultation process undertaken in 2006:

- Access. The inclusion of a slip lane parallel to State Highway 1 as discussed above will mitigate the majority of the concerns raised regarding this issue.
- New roads, including increases in noise. The location of the proposed new collector road south of Rolleston attracted several submissions.
- Business impacts. The inclusion of a slip lane parallel to State Highway 1 as discussed above will mitigate the majority of the concerns raised regarding this issue.

14. Lincoln Township

Existing/potential land uses: The Lincoln Township element of the Transport Strategy utilises existing roads as well as involving the creation of a new road. The existing roads adjoin a range of different land uses from residential, recreation and rural activities. The new road outlined in this element of the Strategy principally affects rural and rural-residential land uses. The purchase of a significant area of rural land will be necessary for this new road.

Designations: Designations will be required for the new road and to upgrade some intersections.

Property access severance: Changes to roading hierarchies will seek to consolidate access onto key arterial routes and avoid the creation of new accesses where possible.

Landscape characteristics/quality: The study area is flat terrain consisting predominantly of grassed open farmland, rural-residential allotments, scattered buildings, some shelterbelts and trees. This element of the Strategy involves widening existing roads, establishing new roads, and constructing new structures like bridges that will create local adverse visual effects. This element of the Strategy will also require the removal or relocation of existing features in the landscape such as trees and vegetation, dwellings and other buildings, fencing, lighting and power poles.

Mitigation of effects on landscape: To ensure that the roading will be integrated into the existing environment areas of roading, improvements will be suitably landscaped where appropriate. Design and landscaping will assist in mitigating some of the adverse effects arising from the establishment of the new road, however such measures will have limited positive impacts on raised structures such as the bridges over the LII Stream.

Geological/geotechnical considerations: New roads, widening, and changes at intersections will require detailed geotechnical investigations during the design phase of roading improvements. This is particularly important when establishing new structures such as bridges.

Drainage: The new road link will pass over two branches of the LII Stream, which is a tributary to the Halswell River. It is also recognised that the location of the new link road to the south of Lincoln is subject to high groundwater conditions particularly in the winter months. Appropriate measures to protect the waterways and address the ground conditions can be assessed at the time of design and construction.

Noise: There will be temporary noise effects during the construction phase. The new road will introduce vehicle noise currently distant from high-volume traffic flows. Increases in traffic-generated noise levels on the new road can be mitigated in areas of higher density residential use through the employment of buffers or barriers.

Maori, archaeological, cultural and heritage sites: There are no known sites of Maori, cultural, historical or archaeological significance affected by the Strategy. However, the LII Stream and the surrounding area will be of interest to Ngai Tahu. Therefore, it is recommended that further consultation with the relevant parties be undertaken at a more appropriate time such as the scheme assessment stage.

Social effects, social severance and property severance: This element of the Strategy seeks to minimise social severance within settlements by ensuring existing links are maintained while new roads bypass settlements. The potential removal of some dwellings and/or reduction of the size of properties may have significant adverse social effects for affected owners and occupiers. At some intersections it is proposed that road links be closed to provide priority to key arterial routes. New roads will lead to the separation of land that is currently in the same ownership or otherwise provide a barrier

between neighbours. There will be considerable adverse social effects for the affected owners and occupiers.

Public transport/cycle: The improved highway and roading network will enable public transportation to operate more efficiently. There may also be opportunities to provide for separate cycle lanes or at least improvements to the shoulders of the carriageway and footpaths.

Consultation to date: No topics were raised in the consultation process undertaken in 2006 which specifically affect this element of the Strategy, although general matters such as public transport, cycling, access to businesses and noise effects may be of relevance.

15. Springston Village

Environmental effects: As no works are proposed for this element of the Strategy, no assessment of social and environmental effects is necessary.

Consultation to date: No topics were raised in the consultation process undertaken in 2006 which specifically affect this element of the Strategy.