

APPENDIX D

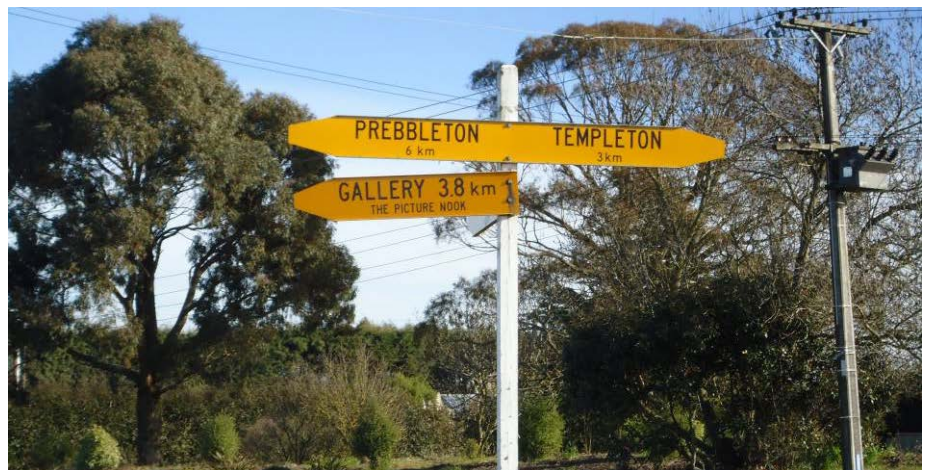
SEMP 004 Construction Traffic Management Plan

CEMP Appendix D SEMP004

Christchurch Southern Motorway Stage 2 and Main South Road Four Laning

Draft Traffic Management Plan for
Construction


November 2012



Record of Amendment

Amendment number	Description of change	Effective date	Updated by

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Glossary of Terms

MSRFL	Main South Road Four Laning
CSM2	Christchurch Southern Motorway – Stage 2
AADT	Annual Average Daily Traffic
ADT	Average Daily Traffic
AEE	Assessment of Environmental Effects
ATTE	Assessment Traffic and Transportation Effects
CCC	Christchurch City Council
CEMP	Construction Environmental Management Plan
CIMS	Coordinated Incident Management System
COPTTM	Code of Practice for Temporary Traffic Management
CSM1	Christchurch Southern Motorway – Stage 1
CTMP	Construction Traffic Management Plan
EED	Engineering Exception Decision
HCV	Heavy Commercial Vehicles
L1 STMS	Level 1 Site Traffic Management Supervisor
L2/3 STMS – NP	Level 2 & 3 Site Traffic Management Supervisor – Non Practising
L2/3 STMS – P	Level 2 & 3 Site Traffic Management Supervisor – Practising
MBIE	Ministry of Business, Innovation and Employment
MOTSAM	Manual of Traffic Signs and Markings
MSR	Main South Road
MTC	Manual Traffic Control
NZTA	New Zealand Transport Agency
PPE	Personal Protection Equipment
RCA	Road Controlling Authority
SDC	Selwyn District Council

SH	State Highway
SSTMP	Site Specific Traffic Management Plan
STMS	Site Traffic Management Supervisor
TC	Level 1 Traffic Controller
TCD	Traffic Control Devices
TMC	Traffic Management Coordinator
TMP	Traffic Management Plan
TTM	Temporary Traffic Management
VMS	Variable Message Sign
vpd	Vehicles per day

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1. Introduction

The NZ Transport Agency (NZTA) seeks to improve access for people and freight to and from the south of Christchurch via State highway 1 (SH1) to the Christchurch City centre and Lyttelton Port by constructing, operating and maintaining the Christchurch Southern Corridor. The Government has identified the Christchurch motorway projects, including the Christchurch Southern Corridor, as a road of national significance (RoNS).

The proposal forms part of the Christchurch Southern Corridor and is made up of two sections: Main South Road Four Laning (MSRFL) involves the widening and upgrading of Main South Road (MSR), also referred to as SH1, to provide for a four-lane median separated expressway; and the construction of the Christchurch Southern Motorway Stage 2 (CSM2) as a four-lane median separated motorway. The proposed construction, operation and maintenance of MSRFL and CSM2, together with ancillary local road improvements, are referred to hereafter as 'the Project'.

A draft Construction Environmental Management Plan (CEMP) has been prepared to provide the framework, methods and tools for avoiding, remedying or mitigating environmental effects of the construction phase of the Project. The CEMP is supported by six SEMP including this document relating to traffic management during construction.

1.1 Proposal description

1.1.1 MSRFL

Main South Road will be increased in width to four lanes from its intersection with Park Lane north of Rolleston, for approximately 4.5 km to the connection with CSM2 at Robinsons Road. MSRFL will be an expressway consisting of two lanes in each direction, a median with barrier separating oncoming traffic, and sealed shoulders. An interchange at Weedons Road will provide full access on and off the expressway. MSRFL will connect with CSM2 via an interchange near Robinsons Road, and SH1 will continue on its current alignment towards Templeton.

Rear access for properties fronting the western side of MSRFL will be provided via a new road running parallel to the immediate east of the Main Trunk rail corridor from Weedons Ross Road to just north of Currags Road. For properties fronting the eastern side of MSRFL, rear access is to be provided via an extension of Berketts Lane and private rights of way.

The full length of MSRFL is located within the Selwyn District.

1.1.2 CSM2

CSM2 will extend from its link with SH1 / MSRFL at Robinsons Road for approximately 8.4 km to link with Christchurch Southern Motorway Stage 1 (CSM1, currently under construction) at Halswell Junction Road. The road will be constructed to a motorway standard comprising four lanes, with two lanes in

each direction, with a median and barrier to separate oncoming traffic and provide for safety.¹ Access to CSM2 will be limited to an interchange at Shands Road, and a half-interchange with eastward facing ramps at Halswell Junction Road. At four places along the motorway, underpasses (local road over the motorway) will be used to enable connectivity for local roads, and at Robinsons / Curraghs Roads, an overpass (local road under the motorway) will be provided. CSM2 will largely be constructed at grade, with a number of underpasses where elevated structures provide for intersecting roads to pass above the proposed alignment.

CSM2 crosses the Selwyn District and Christchurch City Council boundary at Marshs Road, with approximately 6 km of the CSM2 section within the Selwyn District and the remaining 2.4 km within the Christchurch City limits.

1.2 Purpose and Scope

SEMP 004, this draft Traffic Management Plan for Construction (CTMP or the Plan) forms part of a comprehensive suite of environmental controls within the Construction Environmental Management Plan (CEMP, Volume 4) for the construction phase of the Project. The CTMP addresses the potential traffic impacts associated with construction activities for the Project.

A CTMP is required for this Project as there is likely to be significant safety and environmental impacts on SH1 and CSM1 as well as the surrounding network of local authority roads. These impacts could include congestion and delays, distraction of drivers, construction traffic, road diversions and closures.

The purpose of this Construction Traffic Management Plan (CTMP) is to set out the minimum standards required for the implementation of temporary traffic management utilised on the Christchurch Southern Motorway Stage 2 and Main South Road Four Laning Project (the Project). These minimum standards, and any practices and procedures created from them, aim to eliminate, mitigate or isolate any risks to the environment, Project site staff and all road users.

During the development of Site Specific Traffic Management Plans (SSTMP) there is the possibility that an activity may not meet the minimum standards identified in the CTMP, therefore the CTMP also outlines the procedures if minimum standards cannot be met.

The CTMP is a live document that will be continuously reviewed and updated throughout the duration of the Project. It is expected that during the detailed design and construction phases of the Project, the regulations, methodologies, effects and mitigation may be refined or change completely.

This report should be read in conjunction with the Assessment of Traffic and Transportation Effects (ATTE) report, and the other parts of the Construction Environmental Management Plan (CEMP).

¹ CSM2 will not become a motorway until the Governor-General declares it to be a motorway upon request from the NZTA under section 71 of the Government Road Powers Act 1989 (GRPA). However, for the purposes of this report, the term "motorway" may be used to describe the CSM2 section of the Project.

1.3 Performance Standards

In New Zealand, Temporary Traffic Management (TTM) is governed by legislation, specifically the Land Transport Act 1998. Various Land Transport Rules, and their amendments, relating to TTM have been made in accordance with the Act and these are as follows:

- Land Transport Rule: Setting of Speed Limits 2003, Rule 54001 with two amendments;
- Land Transport Rule: Traffic Control Devices 2004, Rule 54002 with five amendments; and
- Land Transport (Road User) Rule 2004, Rule 61001 with six amendments.

The Code of Practice for Temporary Traffic Management (COPTTM) is the principal standard when considering TTM. This code is currently in its 4th Edition. All works associated with TTM are to meet the requirements COPTTM and any amendments or procedures specific to the relevant Road Controlling Authorities (RCA).

The NZTA's Project team will engage all relevant RCAs at the earliest possible opportunity to agree procedures and identify any specific requirements. The Project team will also discuss and agree TTM methodologies for works at critical locations with each RCA, meeting any specific requirements and providing clarity to all parties.

Where road environment constraints affect compliance with COPTTM, the Engineering Exception Decision (EED) process shall be followed. This process identifies the problem, why compliant TTM can't be installed and how safety risks will be mitigated. The EED forms part of the relevant SSTMP.

All relevant consent conditions and designations for this Project will also form part of the requirements for implementation of this CTMP.

The NZTA is currently developing the Traffic Control Devices Manual (TCD Manual) which will provide guidance on industry good practice, including where necessary, practice mandated by law in relation to the use of traffic control devices. This manual will support and reference New Zealand legislation and, in particular, the Land Transport Act 1998 and associated rules and general polices contained in Austroads Guides by providing detailed guidance to meet specific requirements of New Zealand law and practices, New Zealand and, as appropriate, Australian standards and codes of practice, guidelines and published standards of various authorities. The TCD manual will, on completion, replace the Manual of Traffic Signs and Marking (MOTSAM).

2. Environmental Impacts Summary

The Environmental Impacts Summary outlines the anticipated traffic management activities on the Project and their foreseeable impacts. These environmental impacts may change as the Project progresses through the detailed design and construction phases.

2.1 Summary of Traffic Management Activities

This Project is split into two parts, the Main South Road Four Laning (MSRFL) and the Christchurch Southern Motorway Stage 2 (CSM2).

The MSRFL phase of the Project involves pavement widening to four lanes and associated rehabilitation works as well as the construction of an interchange at Weedons Road. The four laning of SH1 will occur from the CSM2 connection to just north of Rolleston. This phase is treated as one zone.

The CSM2 phase of the Project is predominantly “greenfields” construction from the end of the Christchurch Southern Motorway Stage 1 (CSM1) north of Halswell Junction Road to just south of the Robinsons Road intersection on Main South Road State Highway 1 (SH1). Along this route there are interchanges with Halswell Junction Road, Shands Road and SH1 just north of Robinsons Road. CSM2 and associated works will also have an impact on Springs Road, Marshs Road, Blakes Road, Trents Road, Hamptons Road, Waterholes Road, Curraghs Road and Robinsons Road. This phase of the Project has been broken into five zones.

Provided below is a description of the TTM activities for each of the zones of the work based on the currently proposed construction methodology. It is expected that during the detailed design and the early construction phases of the project this construction methodology may be altered.

For a detailed description of the proposed construction methodology refer to the Assessment of Environmental Effects (AEE) and the Construction Environmental Management Plan (CEMP).

2.1.1 Zone 1 – MSRFL including Weedons Road Interchange

During the construction of the alternative property accessways, Jones Road/Weedons Ross Road roundabout and the realignment of the Weedons Road/Levi Road intersection, narrowed lane widths, lane shifts, manual traffic control (MTC) and speed restrictions will be used.

The widening of SH1 will initially be offline and will require only shoulder closure traffic management. As it begins to tie into the existing carriageway, SH1 will have speed restrictions, delineation, narrowed lanes and lane shifts.

When traffic is diverted to the western side speed restrictions and delineation will be in place allowing works to upgrade the existing eastern side. Works on the eastern side also include adjustments to the Berketts Road and Larcombs Road intersections. When works are undertaken to adjust the Berketts Road intersection with SH1, it will be closed with traffic detoured onto Larcombs Road and vice versa for when adjustments are made to the Larcombs Road intersection with SH1. The adjustments to Larcombs Road will permanently prevent entry onto SH1 and temporary information signage, later

replaced with permanent “No Exit” signs, will be placed at the intersection of Larcombs and Berketts Roads to notify the public.

When construction of the Weedons Interchange begins, Weedons–Ross Road will be closed with a detour in place, utilising Jones Road and Hoskyns Road, while maintaining access for properties on Weedons–Ross Road. The construction of the Weedons Road roundabout will require some diversions around the worksite but will remain open as the bulk of the works will be carried out offline. Narrowed lane widths, lane shift and MTC methods of traffic management will be utilised.

Weedons Ross Road has an AADT of 1,290 vpd and is classified as a local road.

2.1.2 Zone 2 – Robinsons Road/Curraghs Road

Construction of the SH1 /Waterholes Road roundabout and new southbound SH1 alignment will initially begin offline but as adjustments to the existing carriageway are required, lane shifts, speed restrictions and manual traffic control will be utilised. Robinsons Road will be closed from the proposed roundabout to SH1 to allow partial construction of the overbridge and the Robinsons Road embankment and will remain closed until completion of the overbridge. A detour will be in place utilising Waterholes and Jones Roads. The Robinsons Road roundabout will not be closed during its construction but will have delineation and speed restrictions as there is a need to maintain access to local businesses.

There will also be a requirement for localised traffic management to aid in the construction of the western and eastern rear accesses early on in the Project. The western rear access involves the construction of a new continuous road between Weedons Ross Road and 250m north of Curraghs Road, with the majority of works being undertaken offline. The eastern rear access road utilises existing local roads, private right of ways and a proposed extension of Berketts Drive, which are low trafficked roads.

Upon completion of the new SH1 alignment and partial construction of the Robinsons Road overbridge traffic will be diverted onto the new SH1 southbound lanes. Shoulder closures, lane shifts and speed restrictions will be in place at the southern transition with only a shoulder closure at the northern transition until completion of the off-ramp. Although the new SH1 alignment will be temporarily bi-directional, standard pavement markings, as per MOTSAM, will be utilised.

Once the diversion is in place, Curraghs Road will be closed from the railway line to SH1. The existing detour for Robinsons Rd will remain in place and access roads will be provided for affected businesses on Curraghs Road. This will allow for the completion of the Robinsons Road overbridge, the tie in of CSM2 to SH1 and adjustments to SH1 for the off-ramp.

Robinsons Road has an AADT of 70 vpd and is classified as a local road while Curraghs Road has an AADT of 330 and is classified as a local road.

2.1.3 Zone 3 –Waterholes Road and Trents Road

The temporary diversion of Trents Road will utilise the CSM2 footprint to connect with Blakes Road. Once the Trents Road overbridge is complete, it will be reopened and Blakes Road will be closed permanently either side of CSM2.

Waterholes Road and Hamptons Road traffic is to be diverted along a temporary carriageway west of the existing road while the new alignment and overbridge is constructed. Speed restrictions and delineation will be required at the transition points of the temporary carriageway as these points will also be used for site access.

Upon completion of the new alignment, Waterholes Road will be realigned to intersect Hamptons Road at a new location requiring speed restrictions, delineation and manual traffic control when the carriageway is reduced to a single lane alternating flow.

2.1.4 Zone 4 – Shands Road / Marshs Road

Shands Road traffic is to be diverted along a temporary carriageway west of the existing road while a new alignment and overbridge is constructed. Speed restrictions and delineation will be required at the transition points of the temporary carriageway as these points will also be used for site access. Marshs Road traffic will be diverted along a temporary carriageway south of the existing road while a new alignment and overbridge is constructed. The temporary alignment will also include a shared path for use by the Rail Trail users with a temporary crossing point near Shands Road. Improvements to the Shands Road/Marshs Road intersection will also be undertaken in the early phases of construction at this site. Narrowing of lanes, lane shifts, speed restrictions and manual traffic control will be required to be in place during Shands Road and Marshs Road intersection works.

Once diverted back to the new alignment, Shands Road will have shoulder closure traffic management in place at each of the motorway entry/exit points. Lane closures and manual traffic control will be in place when pavement and surfacing works are undertaken.

2.1.5 Zone 5 – Halswell Junction Road

The construction of an off-ramp will require the closing of the left hand southbound lane of CSM1 for the construction transition point. This work will require a speed restriction but live lane works will occur outside peak periods allowing full capacity in the PM peak. The new Halswell Junction Road roundabout and John Paterson Drive extension can initially be built offline. The existing John Paterson Drive carriageway is a cul-de-sac that intersects with Springs Road. It is planned that this connection will be severed upon completion of the link from the cul-de-sac to the proposed roundabout at Halswell Junction Road and the CSM1 off-ramp.

Traffic will then be shifted onto the new formations so roundabout works on the existing carriageway can commence. A temporary shared footpath/cycleway will be built on the southern side of the new roundabout. Speed restrictions and delineation will be required over the uneven and unbound surface.

Halswell Junction Road and Springs Road traffic are both to be diverted along temporary carriageways south and west respectively of their existing alignments while the new alignments and overbridges are constructed. Speed restrictions and delineation will be required at the transition points of the temporary carriageway as these points will also be used for site access. The John Paterson Drive connection to Springs Road would also be permanently terminated at this time. As the construction of the Halswell Junction Road overbridge will require the removal of the existing roundabout, built as part of CSM1, traffic will be diverted up the off-ramp onto CSM1 from the new Halswell Junction Road roundabout. This will require a 24 hour lane drop on the southbound CSM1 lanes and delineation on the off-ramp to allow for bi-directional flows.

During the construction of CSM2 and the associated on-ramp, a shoulder closure at the motorway on-ramp will be in place for the majority of the time. Only during pavement and surfacing works will a lane drop and speed restriction need to be in place.

2.2 Summary of Impacts

This section is an overview of the expected environmental impacts that result from the TTM associated with the Project. Reference should be made to the ATTE for a detailed assessment of the traffic impacts resulting from the construction and traffic management activities of the Project.

All construction activities expected to be performed during the Project are regularly undertaken in the Christchurch region. The general impacts from these types of operations are understood by the local construction industry and mitigation measures have previously been successfully implemented.

The expected traffic control operations to be undertaken during the Project and their anticipated impacts are summarised in Table 1. The three components are:

- traffic management activity – the types of traffic management operations likely to be used during construction of the Project;
- impacts – the expected impacts resulting from each traffic management operation on road users; and
- relevant zones – the zones that are expected to experience each type of traffic management activity.

Table 1: Traffic management activity and impacts

Traffic Management Activity	Impact	Relevant Zones				
		1	2	3	4	5
Shoulder Closure	<ul style="list-style-type: none"> Increased side friction reducing comfort and safety of road users Reduced or no shoulder restricting areas for pulling over, i.e. breakdowns or to allow emergency services to pass. Distraction to motorist by visibility of works 					
Lane Closure - Single Direction Flow	<ul style="list-style-type: none"> Reduced capacity due to fewer lanes than existing carriageway. Increased risk of accidents resulting from merge point Distraction to motorist by visibility of works 					
Lane Closure - Single Lane Alternating Flow	<ul style="list-style-type: none"> Reduction in capacity Increased travel time and delays resulting from Stop/Go operation Distraction to motorist by visibility of works 					
Lane Closure - Temporary Diversion	<ul style="list-style-type: none"> Driver confusion due to unfamiliar road environment Increased travel time Increased side friction due to reduced lane widths and reduced shoulders Distraction to motorist by visibility of works Increased risk due to unbound surface 					
Lane Closure - Two Lane Diversion	<ul style="list-style-type: none"> Driver confusion due to unfamiliar road environment Increased travel time Distraction to motorist by visibility of works Increased risk due to unbound surface Increased accident risk of accident due to contra-flow 					
Temporary Speed Limit (TSL)	<ul style="list-style-type: none"> Slower operating speed resulting in increased travel time. Road user non-compliance with speed restriction. 					

Traffic Management Activity	Impact	Relevant Zones				
		1	2	3	4	5
	<ul style="list-style-type: none"> • Driver frustration due to low TSL over long worksite 					
Road Closure	<ul style="list-style-type: none"> • Increased travel times • Congestion on detour routes • Congestion on alternative routes • Confusion and Inconvenience of road users • Detour routes utilising undesirable routes • Disruption to residents and businesses within or adjacent to closure • Severance of Rail Trail link 					
Short-Term Closure for Installation of Long-Term Traffic Management	<ul style="list-style-type: none"> • Increased congestion and reduction in capacity for short periods. 					
Cycle Lane Closure	<ul style="list-style-type: none"> • Increased exposure to traffic and construction activities. • Disruption to users. • Undesirable surface to cycle on. 					
Footpath / Shared Path Closures	<ul style="list-style-type: none"> • Increased exposure to traffic and construction activities. • Disruption to users • Severance of Rail Trail link or temporary shared use path and crossing • Disconnection from Bus stops 					
Site Access	<ul style="list-style-type: none"> • Increased truck movements at point of access slowing traffic and reducing capacity. • Increased heavy traffic on routes to site access resulting in increased travel times, congestion and disruption to local residents/businesses. • Debris spread on carriageway from vehicles leaving site. 					
Property Access Relocation and Closures	<ul style="list-style-type: none"> • Disruption to residents and businesses 					

2.3 Summary of Mitigation Measures

This section identifies the traffic management measures that can be undertaken to eliminate, mitigate and isolate the impacts identified in Section 2.2. Traffic management methods shall be implemented, as per COPTTM, to ensure minimal risk and disruption to all road users in and around the Project area.

Measures to reduce the impact on road users that could be undertaken during the Project are summarised in Table 2. The three components are:

- traffic management activity – the types of traffic management operations possibly used during construction of the Project;
- impacts – the expected impacts resulting from each traffic management operation on road users; and
- typical mitigation measures – activities to be considered that may reduce the impacts during traffic management planning (SSTMPs) and Project management of the works.

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Table 2: Mitigation measures

Traffic Management Activity	Impact	Typical Mitigation Measures
Shoulder Closure	<ul style="list-style-type: none"> Increased side friction reducing comfort and safety of road users Reduced or no shoulder restricting areas for pulling over, i.e. breakdowns or to allow emergency services to pass. Distraction to motorist by visibility of works 	<ul style="list-style-type: none"> Install temporary speed limit Reduce worksite encroachment on live lanes as much as possible
Lane Closure - Single Direction Flow	<ul style="list-style-type: none"> Reduced capacity due to fewer lanes than existing carriageway. Increased risk of accidents resulting from merge point Distraction to motorist by visibility of works 	<ul style="list-style-type: none"> Public notification in local publications and/or by on-site information signage (VMS) Undertake operations outside peak hours Provide advanced warning of lane merging. Extent length of merging point in high speed areas. Allowances in TM setup for property access.
Lane Closure - Single Lane Alternating Flow	<ul style="list-style-type: none"> Reduction in capacity Increased travel time and delays resulting from Stop/Go operation Distraction to motorist by visibility of works 	<ul style="list-style-type: none"> Public notification in local publications and/or by on-site information signage (VMS) Letter drop to affected parties notifying them of the upcoming works. Directing traffic away from worksite by way of advanced VMS signage. Use of temporary barrier systems or sight screens to prevent distraction Undertake operations outside peak hours Allowances in TM setup for property access. Monitoring of queue lengths and delays. Install temporary speed limit
Lane Closure - Temporary Diversion	<ul style="list-style-type: none"> Driver confusion due to unfamiliar road environment Increased travel time Increased side friction due to reduced lane widths and reduced shoulders Distraction to motorist by visibility of works Increased risk due to unbound surface 	<ul style="list-style-type: none"> Public notification in local publications and/or by on-site information signage Sealed carriageway surface Install temporary speed limit Provide directional signage Construct diversion routes with adequate carriageway widths
Lane Closure - Two Lane Diversion	<ul style="list-style-type: none"> Driver confusion due to unfamiliar road environment Increased travel time Distraction to motorist by visibility of works Increased risk due to unbound surface Increased accident risk of accident due to contra-flow 	<ul style="list-style-type: none"> Public notification in local publications and/or by on-site information signage Sealed carriageway surface Use of delineation or markings on diversion Install temporary speed limit Construct diversion routes with adequate carriageway widths

Traffic Management Activity	Impact	Typical Mitigation Measures
Temporary Speed Limit (TSL)	<ul style="list-style-type: none"> • Slower operating speed resulting in increased travel time. • Road user non-compliance with speed restriction. • Driver frustration due to low TSL over long worksite 	<ul style="list-style-type: none"> • Public notification in local publications and/or by on-site information signage • Monitoring and review of use of temporary speed limit to assess if appropriate • Installation of traffic calming measures (narrowing lanes, approach curves and speed humps), once approved by RCAs • Request Police presence on-site • Use of a higher TSL outside working hours if site conditions allow. • Use of a lower TSL in active area of a long worksite • Use of pilot vehicle to control road user speeds
Road Closure	<ul style="list-style-type: none"> • Increased travel times • Congestion on detour routes • Congestion on alternative routes • Confusion and Inconvenience of road users • Detour routes utilising undesirable routes • Disruption to residents and businesses within or adjacent to closure • Severance of Rail Trail link 	<ul style="list-style-type: none"> • Consultation with RCAs to identify detour routes. • Public notification in local publications, radio and/or by on-site information signage (VMS) • Discuss planned activities and impacts with affected residents and businesses. • Letter drop to affected parties notifying them of the upcoming works. • Identification and usage of secondary detour routes if required • Directing traffic away from worksite by way of advanced VMS signage. • Short-term closures to be programmed for night or weekend work • Barriers/fencing to prevent public access • Resident only access routes from intersections or around closure.
Short-Term Closure for Installation of Long-Term Traffic Management	<ul style="list-style-type: none"> • Increased congestion and reduction in capacity for short periods. 	<ul style="list-style-type: none"> • Undertake time consuming activities (barrier installation) at night or in off-peak times.
Cycle Lane Closure	<ul style="list-style-type: none"> • Increased exposure to traffic and construction activities. • Disruption to users. • Undesirable surface to cycle on. 	<ul style="list-style-type: none"> • Provide cycle lane provisions through or around the worksite. • Notify in advance of closure of facilities and direct to alternate route. • Temporary warning signage to warn of cyclists merging • Install temporary speed limit
Footpath / Shared Path Closures	<ul style="list-style-type: none"> • Increased exposure to traffic and construction activities. • Disruption to users • Severance of Rail Trail link or temporary shared use path and crossing • Disconnection from Bus stops 	<ul style="list-style-type: none"> • Letter drop to affected parties notifying them of the upcoming works. • Provide footpath/shared path provisions through or around the worksite. • Provide detour routes in advance of worksite • Direct users to existing crossing points • Provide provisions for alternative crossing points, i.e. signage, delineation and temporary refuges. • Close existing bus stop and direct to alternative bus stop

Traffic Management Activity	Impact	Typical Mitigation Measures
Site Access	<ul style="list-style-type: none"> • Increased truck movements at point of access slowing traffic and reducing capacity. • Increased heavy traffic on routes to site access resulting in increased travel times, congestion and disruption to local residents/businesses. • Debris spread on carriageway from vehicles leaving site. 	<ul style="list-style-type: none"> • Develop site access strategy identifying access points, times and procedures • Identify with RCAs specific routes to be used for haulage of plant and materials, avoiding built up or sensitive areas. • Provision for truck manoeuvres at site access outside of live lanes. • Restrict plant and material movements/deliveries to and from site to period outside of peak periods. • Plant cleaning facilities at site access points. • Frequent cleaning/sweeping of carriageway at access points.
Property Access Relocation and Closures	<ul style="list-style-type: none"> • Disruption to residents and businesses 	<ul style="list-style-type: none"> • Discuss planned activities and impacts with affected residents and businesses. • Letter drops to residents and businesses in works area prior to mobilisation. • Provide provisions to allow access to properties. • Restrict works activities to periods of low or no demands for services.

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3. Implementation and Operation

This section covers the operational procedures for TTM activities during the Project.

3.1 Operation / Management Procedures

3.1.1 Traffic management Procedure Governance

This CTMP is to be the main working document throughout the Project for all activities associated with traffic management and will be reviewed and approved by the key stakeholders and implemented via the Traffic Management Plan (TMP) process. The key stakeholders are envisaged to be the three RCAs, namely the NZTA, Christchurch City Council (CCC) and Selwyn District Council (SDC), as well as the NZ Police. The key stakeholders will be consulted on a regular basis on the requirements prescribed with amendments to be undertaken when identified.

The governance of all traffic management activities will occur through the approval/acceptance process for SSTMPs by the Approving Engineer, NZTA, CCC and SDC or their representatives. Worksites with established traffic management will be routinely monitored and assessed against Key Performance Indicators.

A collaborative approach with key stakeholders will be undertaken from the early stages of the construction phase. This will allow for a “no surprises” approach when planning traffic management activities and will reduce any time related risks in the approval/acceptance process as the stakeholders will have had the opportunity to provide feedback on the proposed methodologies.

3.1.2 Site Specific Traffic Management Plans

SSTMPs describe the nature and extent of TTM operations for the Project and identify how all road users will be managed by the TTM while ensuring their safe negotiation through the Project site. The SSTMPs also identifies procedures to be undertaken by the Project staff to minimise traffic associated risks on site.

All construction activities that have an impact of the roading network, whether it is within the road reserve or not, shall have a SSTMP identifying the approved mitigation measures to be undertaken prior to and during the establishment of the worksite. SSTMPs must be accepted by the relevant RCAs prior to any worksite mobilisation. The process for approval and acceptance of SSTMPs is outlined in Section 3.2.

3.2 Site Specific Traffic Management Plan Development

All SSTMPs that are developed are to comply with the standards and codes of practice identified in Section 1.3, as well as assessing the safety requirements of Project staff and all road users.

During the development of each SSTMP, the impacts and mitigation measures identified in the ATTE as well as the expected impacts and typical mitigation measures in this report are to be considered and documented in the SSTMP. The relevant RCAs will determine the suitability of the proposed SSTMP.

At the completion of the works and removal of all traffic management measures, the worksite is to be free of hazards that have been introduced or left behind as part of the construction activities. This is to ensure the safety of all road users.

The general operational procedures for the development, approval and acceptance of SSTMPs for the Project is set out in Section 3.2.1 to 3.2.3 inclusive.

3.2.1 Site Specific Traffic Management Plan Structure

Each SSTMP will include, but is not limited to, the following:

- SSTMP proforma – This contains all relevant information relating to the Project, the traffic management methodology and standards and identifies the required approvals/acceptances to be attained. The Traffic Management Plan (TMP) – Full Form from COPTTM (4th Edition) will be used for all SSTMPs;
- temporary speed restriction application – this contains specific details about the proposed speed restriction including proposed temporary speed limit, signage locations and timing. The route position information needs to be accurate to allow for Police involvement if worksite speeds need to be managed by enforcement;
- engineering exception decisions – all EEDs relevant to the traffic management operations outlined in the SSTMP, if any, will be appended to the SSTMP;
- layout plans – computer generated (CAD or similar) drawings of the proposed traffic management set out as defined by the proforma. These plans will contain all relevant road features to assist in the management of construction impacts. This shall include existing traffic management sites that are part of the Project or belong to another contractor;
- temporary road closure application – the road closure application and other required information for the relevant RCA; and
- communication documentation – the communication documentation is all relevant public notification information to the SSTMP. This shall include, but not be restricted to, variable message signs (VMS) location strategies, wording for site information signs, draft copies of public notifications (newspapers, advertisements, radio communications and flyers) and a copy of the draft letter to be distributed to affected businesses and residents.

3.2.2 Specific Requirements

3.2.2.1 Network Capacity

Delays caused by construction activities and their associated TTM is a major indicator in the impact a set of works is having on road users. All TTM activities affect the capacity of a network in some form. The impacts of the TTM on the roading network capacity will be assessed and mitigation measures put in place.

Delays are assessed on traffic passing through the worksites as well as vehicle movements on any diversion routes. The maximum delay allowable by COPTTM is 5 minutes. Delays to vehicles travelling through or directly affected by construction activities will be evaluated as well as assessing the capacity of the diversion routes for opportunities to increase the capacity, therefore reducing delays.

Lane closure activities have been shown to cause delays on high usage carriageways and therefore will be avoided if possible. If these are required, they will be used outside of peak hour flows and will be removed if delays exceed 5 minutes or back up to the extent that it's impacting other parts of the network.

When preparing SSTMPs the Project team may need to undertake traffic modelling to assist with the assessment of the impacts on the road network. This modelling will look at queue lengths and delay estimates through the site and effects on the surrounding network. This modelling data is to be provided to the relevant RCAs to assist with the review of the SSTMP.

Activities likely to cause significant delays should avoid being programmed during periods of increased vehicular movements along the State Highways. This includes public holiday weekends, significant events and the Christmas period. NZTA general policy requires the removal of all TTM activities from the network over the Christmas period.

3.2.2.2 Peak Hour Capacity

During the preparation of the SSTMP, the impact of the construction activity and associated TTM on traffic flows will be assessed. Generally, the option of undertaking works during peak periods depend on the classification of the carriageway, traffic volume or strategic significances. The SSTMP will identify the requirements of each RCA in relation to working during peak periods. Any Level 2 classified carriageway, as per COPTTM, Clause A4.3.1, will be required to maintain a two lane two directional flow during peak periods, although these may vary depending on the RCA. These restrictions will prevent activities that are likely to cause significant delays occurring during peak periods but other activities with a minimal risk of delay will be assessed on a case-by-case basis.

3.2.2.3 Lane Delineation

Delineation of traffic lanes will be detailed within the relevant SSTMP for the traffic management activity in place. The selection of appropriate delineation devices can directly affect the impact a TTM set up has on road users. All delineation devices and their placement are to meet the requirements of COPTTM.

Short-term worksites, up to a week in duration, will utilise cones as delineation as they are quick to install and remove and can be easily replaced or repaired if damaged. Issues surrounding the use of cones are that they are easy to knock over, stolen or adjusted by unauthorised persons.

Long-term worksites will use barriers and stick on markers for delineation as well as pavement markings. Barriers and stick on markers are a semi-permanent form of delineation that is generally resilient when hit by a vehicle. The barriers have a larger footprint and require a larger safety zone behind but also provide an additional level of safety for road users and site staff. Stick on markers are positioned the same as cones yet do not fall over blocking lanes like cones. Both barriers and stick on markers require the installation of a short-term worksite to install, creating initial set up delays.

Worksites where a temporary carriageway has been installed for a diversion that has been surfaced will have its delineation provided by pavement markings. This is a cost effective and low impact method of delineation requiring minimum maintenance. It is also likely to have no impact during installation as it can be undertaken prior to being opened as a diversion.

3.2.2.4 Site Access

Site access points are a large contributor to the reduction in capacity of a road network. Each site access will be shown in an accepted SSTMP, detailing the methodology for entry and exit of the worksite. Site access points will be designed to minimise impacts to road users.

The specific requirements for each site access point will be detailed within and installed in accordance with the SSTMP. The requirements may include:

- Types of traffic control, including manual traffic control;
- Restricted/permitted movements into and out of site;
- Restricted periods of usage; and
- Installation of vehicle cleaning facilities.

All vehicle operators will be briefed by the STMS on the procedures and restrictions associated with the relevant site access point.

3.2.2.5 Construction Traffic Movements

Due to the scale of the Project, there will be a significant number of construction vehicle movements in the area, with a large portion of these being heavy commercial vehicles (HCVs). These HCVs will predominantly be carting bulk materials and plant to and from the worksites. The increase of HCVs will impact the capacity of some roads and intersections as well as directly affecting traffic at points of site access.

Any over dimensioned vehicle will require a permit from the relevant RCAs and may require additional traffic management activities to allow it to travel to and from and access the relevant worksites.

Construction vehicle movements, specifically HCVs, will be detailed in each SSTMP for acceptance by the relevant RCAs. The SSTMP will also outline the operating hours for HCVs on public roads with Level 2 carriageways to minimise activity during peak periods, the frequency of HCV movements and routes to be used for haulage of materials and the points of access to each site. The SSTMP will also outline any mitigation measures to be undertaken to reduce any impacts associated with HCV movements.

All truck drivers are to be briefed on the appropriate routes and movements for entering the site. There are also to be made aware of sensitive areas and points of high pedestrian and cyclist usage.

Truck washes are to be present at all major site access points to reduce spoil on the carriageways. Routine inspections of cartage routes and removal of loose material will be undertaken to mitigate risks to the road users.

3.2.2.6 Traffic Detours

Road closures and their associated detour routes will be contained within the accepted SSTMPs. The relevant RCAs are to be engaged prior to the submission of the SSTMP with any comments included in the SSTMP. Any comments from a RCA found to be unsuitable or impractical for the traffic management operation are to be responded to, identifying why they will not be included.

A public information campaign for each road closure will be undertaken via approved media, publication and radio advertisements, information signage including VMS, for a period suitable to the requirements of the relevant RCA, generally 7 or 14 days. The aim of advertising the road closure is to encourage road users to find an alternative route thereby reducing traffic flows on the planned road closure.

The SSTMP will also detail procedures to mitigate any impacts on residents and businesses affected by the road closure or the detour route. Traffic flows on the detour routes will be monitored and assessed over the course of the closure, as detailed in section 3.3.3

3.2.2.7 Passenger Transport Services

During the initial planning stages of the construction phase of the Project, the affected bus services will be identified. This will allow for early consultation with public transport stakeholders assisting in the development of mitigation measures or allowing a suitable period of time to adjust services. Consultation will be carried out with the following public transport stakeholders during the formation of the relevant SSTMPs.

- NZTA;
- Environment Canterbury;
- public transport operators; and
- the Ministry of Education (for school bus routes).

During the development of the SSTMPs, impacts on the public transport network will be assessed with mitigation measures detailed within the SSTMP for acceptance by the relevant RCAs.

3.2.2.8 Property Access, Existing On-Site Parking and Manoeuvring Areas

The construction activities of the Project and their associated traffic management operations will impact on residential and business property access. These impacts are expected to include:

- worksites blocking direct access or delaying access to property;
- access being within a road closure; and
- access being on a detour or alternate route.

Communications with all affected properties are to be undertaken with detailed records kept by the Project team. The SSTMP shall contain details identifying the proposed mitigation measures for all relevant impacts on the properties for acceptance by the relevant RCA. These mitigation measures shall be undertaken as detailed and may include provisions for alternate access, access during critical periods of time and amended construction methodologies to reduce the impact.

3.2.2.9 Pedestrian, Mobility Impaired and Cycling Access

Pedestrian and shared facilities will be maintained where possible. If the use of such facilities is restricted by the works an alternative will be provided. This alternative could be any of the following:

- temporary footpath/shared path including signage and barriers separated from traffic;
- designation of an alternate route with signage directing users to it;
- measures mitigating localised hazards; and
- temporary crossing points including median islands.

The use of such facilities will require careful consideration as some mitigation measures also create other impacts. When closing a footpath and directing pedestrians to cross to the other side, they are now more exposed to the traffic. In this instance, a temporary refuge will need to be installed or the footpath will be closed at the nearest existing crossing point. The SSTMP is to include and detail any required provisions for pedestrians.

Cyclist facilities will be maintained where possible. If the use of such facilities is restricted by the works an alternative will be provided. Possible alternatives could include the supply of a temporary facility or directing users to a diversion prior to them entering the worksite. If an alternative facility is not available, the SSTMP will detailed warning signage and speed restrictions to be installed so cyclists can safely negotiate the worksite in the live lane. The closure of a cycle facility without alternative provisions will require justification as to its closure.

Long-term or permanent closures of pedestrian and cyclist facilities will be advertised in local media.

3.2.2.10 Traffic Management Communications

Communication campaigns will be undertaken at various stages of the Project for traffic management related activities. The strategy for these campaigns is identified in the Stakeholder and Communication Management Plan, which is part of the AEE Report.

The level of communication for each part of the works will depend on the location, timing and impact of the specific worksite. Communication activities may include:

- letter drops to affected properties;
- visit by Project team member to discuss impacts of works;
- project signs and information boards;
- VMS or static signage informing of Project dates, timeframes and alternate routes; and
- public notifications in local publication, on the internet and on the radio.

3.2.2.11 Emergency Action Plan

Prior to the implementation of any TTM, an Emergency Action Plan must be prepared and approved by all RCAs. This action plan will outline systems, procedures and responsibilities on the Project team in the event of an emergency. The Emergency Action Plan will also conform to the principles of the Coordinated Incident Management System (CIMS) and any specific requirements of the RCAs. Emergency services will also be consulted during the development of the Emergency Action Plan.

Each SSTMP will also outline site specific requirements in case of an emergency. This will include diversion routes or secondary detour routes in case of an accident or major delays in the worksite or detour route (if a road closure is in place). Methodologies to reduce Project time over-run should also be considered.

In the event of an accident the NZTA's Project team will provide immediate assistance to emergency services as well as maintaining appropriate TTM whilst the site is being brought under control. The STMS will ensure that traffic management staff remain safe while continuing to provide safe passage through the worksite, notify the relevant authority, assisting where possible and meeting all requirements of COPTTM.

3.2.3 SSTMP Approval/Acceptance Process

A collaborative approach will be undertaken with the RCAs from an early stage of the Project to ensure a "no surprises" environment. This will result in an agreed traffic management methodology, meeting any specific requirements of the RCAs and reducing the risk of time delays in getting acceptance. Any impacts resulting from the construction and subsequent traffic management will be assessed on a case-by-case basis prior to submission to the relevant RCAs.

All SSTMPs for the NZTA or the CCC shall be submitted via the Transport for Christchurch website (www.transportforchch.govt.nz), identifying it as part of this Project and assigning the designated Approving Engineer.

All SSTMPs for SDC are to be submitted to the Approving Engineer, who will forward to the SDC's Traffic Management Coordinator (TMC) for acceptance once they are approved.

The Approving Engineer will be appointed by the NZTA's Project team and must be independent from the preparation of the SSTMP and hold the Level 2/3 Site Traffic Management Supervisors - Non Practicing (L2/3 STMS-NP) qualification as a minimum. The Approving Engineer's role is the review of all SSTMPs prior to submission to the relevant RCAs TMCs to ensure they meet the requirements of COPTTM.

3.3 Monitoring

It is the responsibility of the STMS, who can be assisted by others of appropriate qualification, to undertake the monitoring requirements as set out in the SSTMP and governed by COPTTM. The site layout, TTM control devices, traffic behaviour and on site staff behaviour and PPE are all evaluated by the STMS for compliance with the SSTMP.

Each site will also be evaluated as to the effectiveness of the any mitigation detailed in the SSTMP by via traffic management audits, travel time assessments and feedback.

3.3.1 Traffic Management Auditing

External audits are to undertaken randomly of each worksite on a monthly basis to ensure compliance with the SSTMP and COPTTM. The auditor must be suitably qualified and independent from the preparation of the SSTMPs and the implementation of the traffic management. This would generally be the Approving Engineer or approved representative.

The process to undertake an audit is defined within COPTTM and is to be carried out as such. The auditor is to contact the STMS, or the designated STMS, upon arrival on-site and give them the opportunity to be present when the audit is undertaken. This will provide for a collaborative working environment between the parties involved in traffic management and allows the STMS to make the required changes to comply with COPTTM, although these will still be recorded in the audit.

If the audit is undertaken while the site is unattended, the auditor will provide the results to the STMS when practical unless there are issues that affect the safety of road users. If this is the case, the auditor will contact the STMS immediately and advise of the changes required to make the site safe.

All audit scores will be supplied to the RCAs on a monthly basis and are to be kept available if directly requested by a RCA.

3.3.2 Travel Times

The key objectives of the traffic management operations during the Project is to provide a safe and efficient road network to all road users, which can both be monitored by a travel time analysis. Significant delays can result in changes to driver behaviour, increasing the risk to all road users.

Travel times will be monitored by the Project team to assess the performance of road network while TTM is in place. These assessments will be undertaken on a fortnightly basis to evaluate delays attributed to any TTM activities. The base journey time will be measured prior to the commencement works.

Journey times will be monitored between Templeton and Rolleston in both directions. These trips are to be undertaken using a GPS unit, recording speeds, locations and travel time between two fixed points.

The travel time surveys are to be provided to NZTA on a monthly basis.

3.3.3 Feedback

All feedback (positive and negative) received is to be recorded, identifying the relevant site, time and date, contact details of respondent (if given) and reason for feedback. The Project team is to then assess the feedback against the relevant SSTMP and identify any measures to be undertaken and provide a brief report to the relevant RCAs. The Project team is to also follow up the feedback with the respondent informing them of measures taken to resolve the issue, if any, or to seek additional information. All additional communications with the public are to be recorded.

The types of feedback are to be recorded and assessed monthly to identify trends where performance can be improved.

All feedback received by the RCAs or the Project team are to be communicated to the other parties as per section 3.4. A monthly report summarising all feedback, additional communications and their outcomes is to be provided to the RCAs.

3.4 Reporting

This will be undertaken in conjunction with the monitoring activities stated in Section 3.3.

3.4.1 Reporting by NZTA's Project Team to RCAs

The NZTA's Project team shall communicate the following to the NZTA, CCC and SDC or their representatives:

- all crashes within the Project's worksite within 24 hours as specified in COPTTM. The Ministry of Business, Innovation and Employment (MBIE) must also be notified of crashes resulting in serious harm injuries;
- a quarterly report with results from monitoring of the Project as detailed in Section 3.3;
- foreseeable issues with their traffic management, including road user behaviour;
- problems resulting from traffic management of an unrelated party;
- any feedback received relating to the traffic and/or traffic management;
- any instances of non-compliance with the SSTMP or the CTMP of the traffic management setup. This report is to identify the cause and actions undertaken to mitigate any impacts resulting from the non-compliance; and
- a copy of the CTMP when revisions are made.

3.4.2 Reporting by RCAs to NZTA's Project Team

The NZTA, CCC and SDC or their representatives shall inform the NZTA's Project Team of the following:

- any feedback received through their organisations relating to the traffic and/or traffic management; and
- any audit undertaken by their staff of a worksite that is part of the Project.

3.5 Training

The Contractor shall identify at least two staff members qualified as Level 2/3 Site Traffic Management Supervisors - Practicing (L2/3 STMS-P) who will be permitted to control all the worksites within the Project. One L2/3 STMS-P must be within 30 minutes of each worksite at any time.

This Project contains worksites that are situated on Level 1 roads, Level 2 roads or a combination of the two. Any worksite on Level 1 roads requires a qualified Level 1 Site Traffic Management Supervisors (L1 STMS), as a minimum, to be on-site when the site is attended or within 60 minutes if unattended. Each worksite on a Level 2 road or a combination of Level 1 and 2 roads requires a L2/3 STMS-NP, as a minimum, to be on-site. The L2/3 STMS-P is required to brief the L2/3 STMS-NP prior to handover, document the briefing and be present for the setup, alterations and removal of the worksite. All other traffic management staff are to undergo NZTA's Traffic Controller (TC) training prior to any involvement with this Project as a minimum.

Any Project staff undertaking the planning or monitoring of the worksites shall be qualified, as a minimum, L1 STMS for Level 1 worksites or L2/3 STMS–NP for Level 2 worksites.

The appointed STMS for each worksite shall wear the STMS yellow high-visibility vest so they are readily identifiable to visitors to site. The appointed STMS is also to brief all site staff of the requirements of the SSTMP, including PPE, and his authority as STMS.

3.6 Feedback

The CEMP (Section 5.6) identifies the process by which feedback is to be managed.

All feedback received by the Contractor and its site personnel, including the STMS, relating to the traffic and/or traffic management shall be reported to the Approving Engineer, the NZTA and the other relevant RCAs or their appointed representative. The feedback is to be assessed with the relevant SSTMP(s) and a draft response is to be provided to the Approving Engineer who will discuss it with the relevant RCAs. Possible response could involve the revision of the relevant SSTMP, changing of traffic control devices and/or a revision to this document (the CTMP). All changes to the SSTMP will require approval from the Approving Engineer and acceptance by the relevant RCAs.

3.7 Roles and Responsibilities

The Project team is responsible for the preparation and implementation of each SSTMP. It is also their responsibility to ensure that each SSTMP and all TTM meet the requirements of COPTTM and the CTMP. The Project team will be responsible for all documentation associated with the TTM and are to ensure its compliance with the CTMP. This documentation is to be supplied to any of the RCAs at their request.

Each SSTMP will be approved by the Approving Engineer and accepted by the NZTA, CCC or SDC or a combination of the three of them.

Independent TTM audits will be undertaken as detailed in section 3.3.1. The audit findings are to be provided to the relevant RCAs within 2 days of being undertaken. If an audit identifies the site “needs improvements” or is “dangerous” the audit result will be forwarded to the relevant RCA upon completion of measure to bring the site up to compliance. The Project team will also undertake other monitoring activities as indicated in section 3.3. These results will be provided to the RCAs in monthly reports, unless otherwise requested.

3.8 Post-Construction Transition Phase

Upon completion of this Project the remaining TTM will be removed, leaving the sites in a condition equal or better than time of possession. Once a SSTMP has expired or been closed, the roadspace becomes available to the RCA to use as they see fit.

4. Review of the Construction Traffic Management Plan

The CTMP will be reviewed and updated during the course of the Project. Outcomes of each review will be supplied to the key stakeholders prior to undertaking amendments to the CTMP. Changes to COPTTM or the requirements of the key stakeholders may trigger a review.

Reviews are to be undertaken by the Project team with involvement of the NZTA Project manager at the start of construction and at regular intervals throughout the Project. The frequency of reviews will be agreed at the completion of the first pre-construction review. All decisions, and their reasoning, will be recorded and draft changes made to the CTMP. These changes will then be approved by the key stakeholders. The review will cover the following topics:

- role and responsibility changes within the Project affecting the CTMP;
- changes in legal requirements, standards or specifications of any of the RCAs;
- changes to traffic management process, including industry best practice;
- the results of monitoring as documented in the CTMP; and
- to cover any other Project issues.

The original CTMP and subsequent revision will be retained on file, but marked as superseded. Each new revision is to be identified with a version number and issue date.

Appendix A: Relevant Project Conditions

[To be added when confirmed]

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