Buller Plateaux Continuation Project – Denniston Plateau Access

Integrated Transport Assessment

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Bathurst Resources Limited

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Executive Summary

Bathurst Resources Limited (including its subsidiary companies Bathurst Coal Ltd and Buller Coal Ltd) and joint venture BT Mining Ltd ("**Bathurst"**) are seeking approvals through the Fast-track Approvals Act 2024 ("**FTAA"**) for the Buller Plateaux Continuation Project (**"BPCP"**, or the **"Project"**).

The Project covers areas on both the Stockton Plateau and the Denniston Plateau (collectively referred to as the Buller Plateaux). The purpose of the Project is to reconsent the existing infrastructure and mining operations associated with the existing Stockton Mine and to provide access to additional coal mining areas across the Buller Plateaux.

Stockton Mine is located at the northern end of the Buller Plateaux. The proposed extension to the mining areas includes the expansion of the existing consented Escarpment Mine on the Denniston Plateau (called Escarpment Extended) and the development of the new mining area Mount Frederick South. A new haul road, the Upper Waimangaroa Haul Road (UWHR), will be constructed to link Escarpment Extended and Mount Frederick South with the existing infrastructure at Stockton.

The legal road connection between Waimangaroa and the Denniston Plateau comprises Banbury Street, Denniston Road and Burnetts Face Road, which together are known colloquially as the Denniston Track. The Denniston Track will be used to service the new mine development at Escarpment Extended and will also be used by construction related traffic involved in the formation of the new UWHR to construct the road from south to north toward the existing Stockton Mine.

Since the Project will increase the volume of traffic using the public road network during the construction phase and also during the subsequent operational phase, this report provides an assessment of the potential effects on the transport network with a specific focus on the Denniston Track. The effects of the project on Millerton Road which provides access to Stockton are addressed in a separate report.

During the initial establishment phase of Escarpment Extended, which also includes construction of the proposed UWHR to connect the new mining area with the Stockton Mine, the Project is expected to generate up to 120 additional vehicle movements per day (vpd) on weekdays with up to 80 of these being heavy vehicles the rest being light vehicles associated with staff travel and contractors.

On weekdays, the peak hour volumes of mine related traffic are expected to be in the range 20 to 25 vehicles per hour (vph) as workers travel to and from the Escarpment Extended site. This will comprise a mix of buses and light vehicles. During the day, the typical hourly volumes of construction traffic will be about 5 vph which primarily will be heavy vehicles.

Once coal production starts, the volume of large heavy vehicle movements using the Denniston Track will reduce but there will be a higher volume of light vehicles and rigid trucks than during the construction phase.

In both the construction and operation phases, the additional vehicle movements and specifically the high proportion of heavy vehicles will contribute to two primary effects on the existing users of the Denniston Track. Firstly, since heavy vehicles will travel more slowly than the existing traffic, which

predominantly comprises light vehicles, the movement of existing traffic both up and down the road is likely to be delayed due to the lack of safe passing opportunities. Secondly, although the Denniston Track has sufficient width to accommodate two-way movement of light vehicles and smaller commercial trucks, there are sections of narrow carriageway and small radius curves where two-way movement of these vehicles in conjunction with a large articulated vehicle will be constrained. This will increase the risk of head-on crashes or vehicles leaving the carriageway if the movement of large trucks is not managed to minimise the risk of conflicts arising.

Traffic Management Plan

Mitigation of the potential traffic effects will involve minor improvement works to the road network and implementation of driver communication protocols for all mining activity related vehicles. The purpose of the communications protocol is to ensure that trucks are aware of the locations of other vehicles and can utilise identified areas to pull over to minimise the risk of conflicts arising. It is recommended that a Traffic Management Plan (TMP) is established for the establishment and operation of the Escarpment Extended mine to document these. The TMP should include details of:

a) site access arrangements;

b) construction programme and construction activity time restrictions;

c) traffic volumes (construction phase and operational phase);

d) management plan for oversize loads (numbers and transport times);

e) driver communication protocols;

f) any necessary road improvements;

g) pavement maintenance plan;

h) monitoring; and

i) communication / complaints arrangements.

The following improvements to the public road network are considered necessary to provide for the safe function of the roads.

Denniston Track

1. Construction of wide shoulder areas where practical to provide opportunities for slow vehicles to pull over clear of the traffic lane. The locations of wide shoulder areas will be confirmed as part of the TMP.
2. New road marking and signage at the Denniston Road / Burnetts Face Road / Boswell Street intersection.
3. Maintenance and repair to the road pavement to ensure that the road remains safe for all road users.

Burnetts Face Road

4. Widen Burnetts Face Road at small radius curves between Denniston and Whareatea Mine Road to provide a minimum sealed carriageway width of 6.6 m.

Whareatea Mine Road

5. Widen the sealed carriageway at the Whareatea Mine Road / Burnetts Face Road intersection to enable two-way movement of trucks.

Denniston Track Maintenance Plan

It is recommended that Bathurst and BDC establish an agreement on a road maintenance and repair plan for the Denniston Track. Although the primary purpose of the plan will be to ensure that the road is maintained in a safe condition for all road users, it is recommended that it includes a long-term objective that supports safety improvements with a progressive removal of safety hazards when opportunities arise. The types of safety improvements works that should be considered include carriageway widening and upgrades to roadside drains to ensure that there are no unrecoverable edges within 0.5m of the traffic lanes.

With the implementation of the TMP inclusive of the driver communications protocol, the Denniston Track maintenance plan and improvements to the transport network, it is considered that the mine related traffic will not contribute to adverse safety effects on the transport network.

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Abbreviations

ADT	Average Daily Traffic volume
Bathurst	Bathurst Resources Limited (including its subsidiary companies: Bathurst Coal Ltd and Buller Coal Ltd) and joint venture BT Mining Ltd
BDC	Buller District Council
BPCP	Buller Plateau Continuation Project
CAS	Crash Analysis System
CHPP	Coal Handling and Processing Plant
HCV	Heavy Commercial Vehicle
HPMV	High Productivity Motor Vehicle
km	Kilometre(s)
km/h	Kilometres per hour
LCSIA	Level Crossing Safety Impact Assessment
m	Metre(s)
NZTA	New Zealand Transport Agency Waka Kotahi
RCA	Road Controlling Authority
SH6	State Highway 6
SH7	State Highway 7
SH67	State Highway 67
SH69	State Highway 69
TMP	Traffic Management Plan
UWHR	Upper Waimangaroa Haul Road
vpd	Vehicles per day
vph	Vehicles per hour

Project Context

1 Introduction

1.1 Project Overview

Bathurst Resources Limited (including its subsidiary companies Bathurst Coal Ltd, and Buller Coal Ltd) and joint venture BT Mining Ltd ("**Bathurst"**) are seeking approvals through the Fast-track Approvals Act 2024 ("**FTAA"**) for the Buller Plateaux Continuation Project (**"BPCP"**, or the **"Project"**). Full details are included in the BPCP Project Description.

The Project covers areas on both the Stockton Plateau and the Denniston Plateau (collectively referred to as the Buller Plateaux). The purpose of the Project is to reconsent the existing infrastructure and mining operations associated with the existing Stockton Mine and to provide access to additional coal mining areas across the Buller Plateaux.

Figure 1-1 shows the locations of the existing mine areas east of State Highway 67 (SH67). Stockton Mine is located at the northern end of the Buller Plateaux with the Cypress and Mt Fred South mines immediately to the south. The proposed extension to the mining areas includes the expansion of the existing consented Escarpment Mine on the Denniston Plateau (called Escarpment Extended), and development of the new Mount Frederick South Project sub-area. A new haul road (the Upper Waimangaroa Haul Road (UWHR)) will be constructed to link the Escarpment Extended and Mount Frederick South with the existing infrastructure at Stockton.

The legal road connection between Waimangaroa and the Denniston Plateau comprises Banbury Street, Denniston Road and Burnetts Face Road, which together are known colloquially either as the Denniston Track or Denniston Road. The Denniston Track will be used to service the new mine development at Escarpment Extended and will be used by construction related traffic involved in the formation of the new UWHR to construct the road from south to north toward the existing Stockton Mine. Construction of the northern section of the UWHR will occur in parallel beginning at Stockton and progressing south.

Since the construction works and operation of the new mining areas (Escarpment Extended) will increase the volume of traffic using Denniston Track which forms part of the public road network, this report provides an assessment of the potential effects on the transport network.

The report has been structured to provide:

- Site Context
- Existing Transport Environment
    - Description of the transport network;
    - Description of traffic volumes on the network;
    - Assessment of road and rail safety;
- Construction Effects
    - Assessment of expected traffic generation of construction works;
    - Assessment of expected effects and mitigation;
- Operational Effects.
    - Assessment of expected traffic generation of operational activity;

- Assessment of expected effects and mitigation.

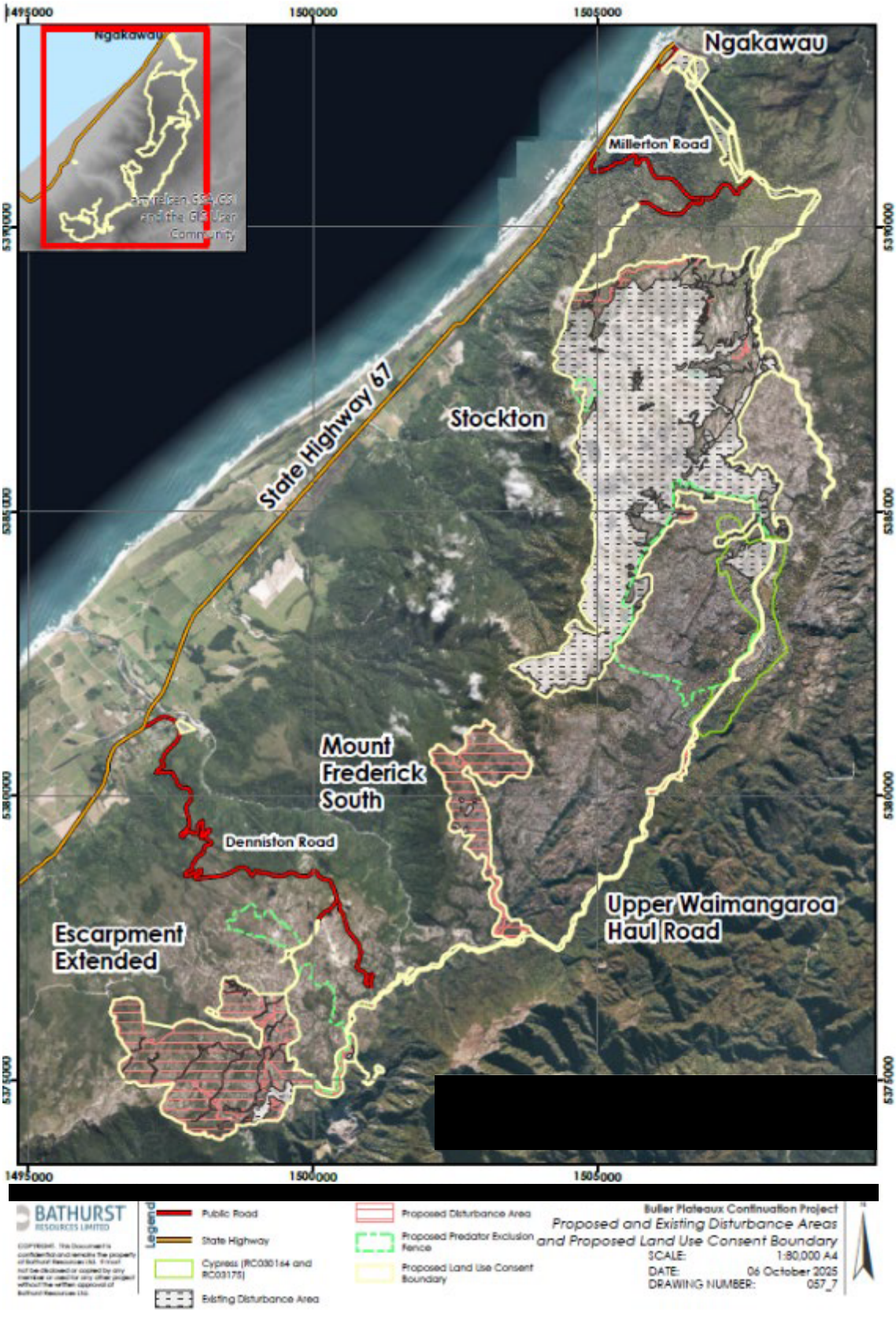

Figure 1-1: Project Areas

2 Project Context

2.1 Location

Figure 2-1 shows the local area transport context for Escarpment Extended on the Denniston Plateau. State Highway 67 (SH67) provides the only strategic road link in the area connecting State Highway 6 (SH6) south of Westport to Westport before continuing north along the coast to Karamea. SH67 follows an alignment that passes beside Waimangaroa and through the smaller settlements of Granity and Ngakawau. There are three railway level crossings on SH67 between Westport and Hector. There are also level crossings on many of the side roads to the east of SH67 between Waimangaroa and Ngakawau including on Millerton Road which provides the access to Stockton Mine.

The Stockton Mine is located on a plateau to the east of Granity and Ngakawau. Access to Stockton Mine is via Millerton Road at the northern end of Granity.

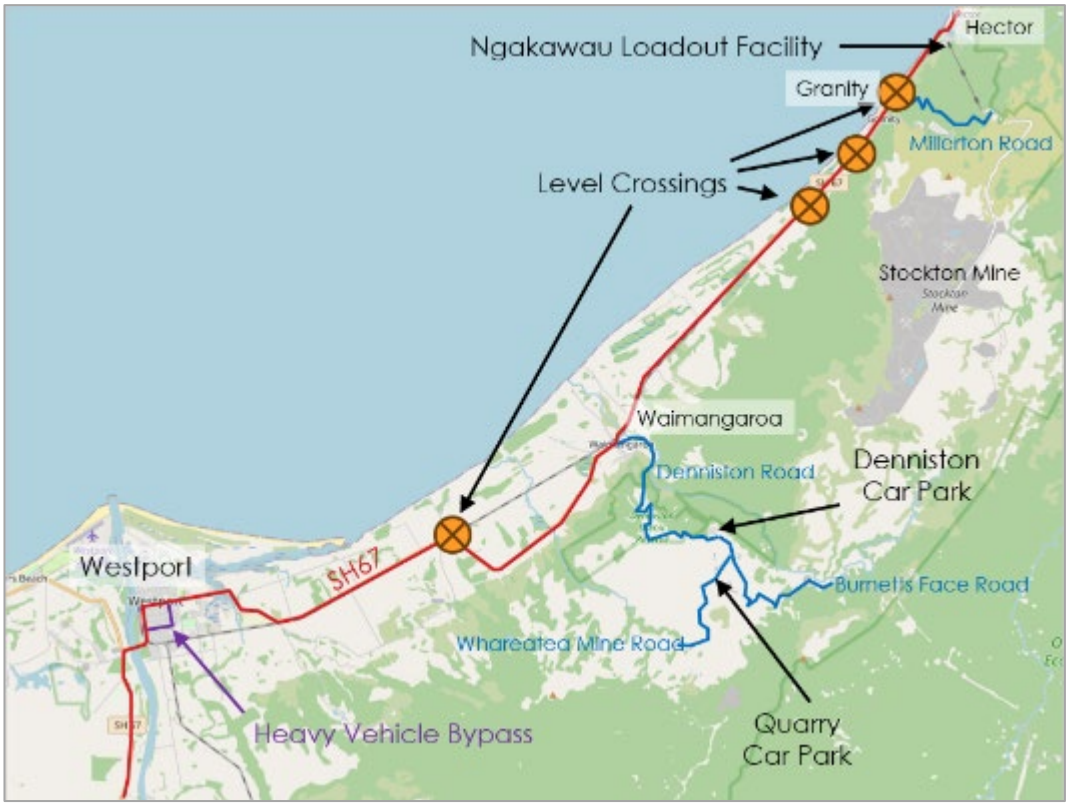

Figure 2-1: Project Transport Context

The Denniston Plateau is located south-east of Waimangaroa with the only road access being via the Denniston Track which comprises Banbury Street, Denniston Road and Burnetts Face Road. There is a parking area at the top of the Denniston Road for visitors to the historic mining area and another visitor car park at the eastern end of Burnetts Face Road. Whareatea Mine Road provides access to the Escarpment Mine which is currently under care and maintenance. A range of mountain bike tracks have been established on either side of this road and an informal parking area (known as the “Quarry car park”) exists at the end of the public road section, about 500 metres south of Burnetts Face Road.

Figure 2-2 shows the railway network for the West Coast area. The railway broadly follows an alignment close to the SH67 to Westport before heading inland via the Buller Gorge to Inangahua. The railway then heads south via Reefton and Ikamatua towards Greymouth. There is a secondary coal loadout facility in Ikamatua which can be used in the event of a closure of the railway line between Ngakawau and Ikamatua.

Figure 2-2: West Coast Railway Network

Figure 2-3 shows the state highway network for the northern West Coast area. Travel between the Project area and wider region involves using SH67 to SH6 south of Westport. SH6 provides connections to towns along the West Coast to the south and a link towards towns to the north. Travel to the east coast involves travel via Inangahua and Reefton using State Highway 69 (SH69) from Inangahua to Reefton and then State Highway 7 (SH7).

Figure 2-3: State Highway Network

Existing Environment

3 State Highway 67

3.1 Road Formation

SH67 provides the only road connection between Westport and Ngakawau. It has been generally formed as a two-lane, rural highway with centre-line and edge-line markings (Photograph 3-1). The highway has been constructed with a typical carriageway width of 6.8 metres (m) (MobileRoad) with narrow sealed shoulders. There are grassed berms that separate the carriageway from deep road-side drains.

Photograph 3-1: SH67 - Typical rural formation

SH67 south of Waimangaroa is classified by New Zealand Transport Agency Waka Kotahi (NZTA) as a High Productivity Motor Vehicle (HPMV) route, which means that it is suitable for movement of trucks carrying heavier loads (up to 50 tonnes).

3.2 Intersections

3.2.1 SH67 / McGill Street (Waimangaroa)

McGill Street meets SH67 at a Give-Way controlled intersection on the edge of Waimangaroa. A right turn bay has been marked on the western approach to the intersection as shown in Figure 3-1. The McGill Street approach to the intersection includes a small radius curve so that vehicles approach SH67 at close to right angles.

There is some widening of the SH67 pavement on the eastern side of the road on the SH67 northern approach to the intersection which from observation is regularly used as an informal parking area by truck drivers that stop to visit the nearby café (Photograph 3-2).

The available sight distances from the McGill Street approach are about 170 m to the north (Photograph 3-2) and exceed this to the south-west which is appropriate for the sign-posted speed limit of 70 kilometres per hour (km//h) on SH67 (Photograph 3-3). This meets the Austroads recommended minimum sight distance requirements.

Photograph 3-3: SH67 southwest of McGill Street

3.3 Railway Crossings

3.3.1 SH67 at Beach Road

Figure 3-2 shows an aerial view of the rural railway crossing close to the SH67 / Beach Road intersection at Fairdown between Waimangaroa and Westport. SH67 crosses the railway east of a small radius curve and the Beach Road intersection. The Beach Road intersection includes a short auxiliary left turn lane and a flush median on SH67 that will provide some storage space for vehicles waiting to turn into Beach Road.

There are 35 km/h advisories on the chevron boards at the curve, along with pavement warning markings and warning signs on SH67. Photograph 3-4 shows that the crossing includes flashing lights and bells.

While there is good approach visibility to the flashing lights from the southeast, the approach sight distance from the southwest is constrained by the curve in the highway and vegetation between the highway and railway to about 100 m. The shortfall compared with a required sight distance of 180 m for a 100 km/h road is mitigated to some extent by the speed advisories for the curve.

Photograph 3-4: SH67/ Beach Road Railway crossing

3.4 Traffic Volumes

Figure 3-3 shows the annual daily traffic volumes on SH67 recorded by NZTA at their count site north of the Orowaiti River (northeast of Westport) since 2018. The average daily volume over that time has risen from about 2,100 vpd in 2018 to about 2,500 vpd in 2024. The 90th and 98th percentile volumes represent traffic volumes during the busiest five and two weeks of the year, respectively. The difference between these and average volumes indicates that there is a strong seasonal variation in traffic volumes. The 90th percentile volume was about 3,000 vpd during the 2023-2024 period compared with about 2,500 vpd prior to 2022.

In the 6-month period, July to December 2024, the average weekday traffic volume on SH67 north of Orowaiti River was about 2,720 vpd with a 98th percentile volume of 3,160 vpd. These volumes were higher than during the similar period in 2023 which primarily reflects the effect of the closure of the railway between Reefton and Ikamatua in June 2024 for tunnel repairs which resulted in the need for more truck movements to transport coal from Ngakawau to Ikamatua.

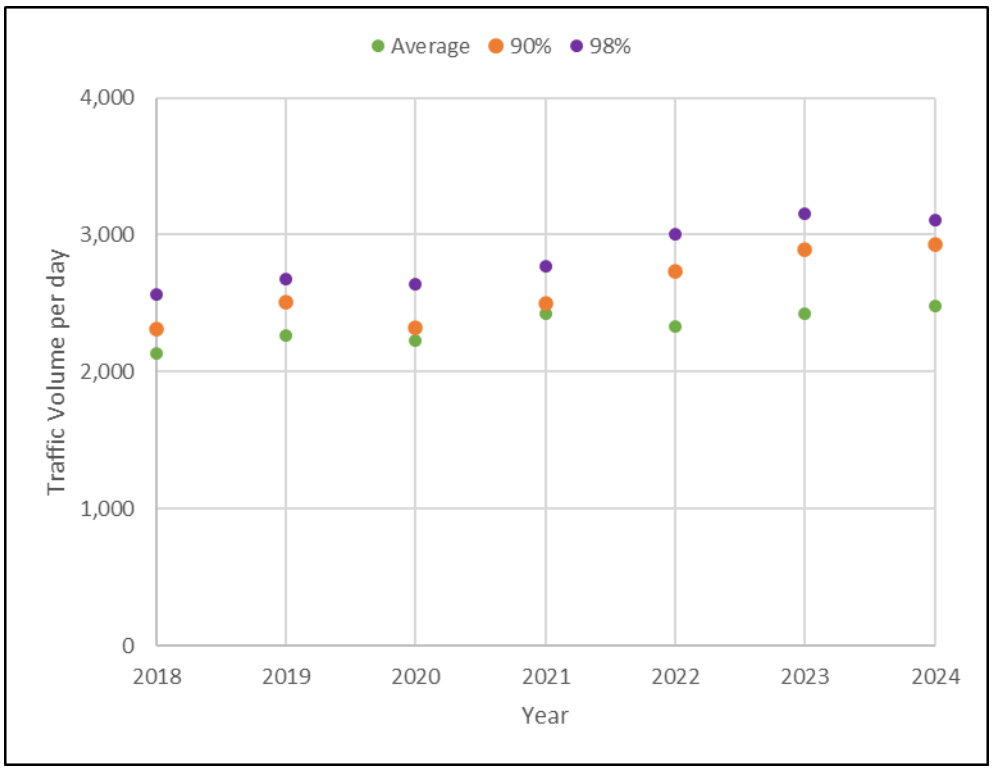

Figure 3-3: Average Daily Traffic Volumes - SH67 North of Orowaiti River (Source: NZTA 06700009)

Figure 3-4 shows the daily traffic volumes recorded by NZTA on SH67 north of the Orowaiti River over the 2023-24 period. The weekday volumes show a seasonal variation with higher volumes during the summer months, typically about 2,900 vpd, and the lowest volumes in the winter months. Weekend traffic volumes are lower than on weekdays at 1,500-2,000 vpd.

The daily weekday traffic volumes since June 2024 have been highlighted as these demonstrate the effects of the railway closure. In the six month period July to December 2024, the average weekday traffic volume was 2,720 vpd compared with an average volume of 2,550 vpd for the equivalent period in 2023. This represents an increase in the weekday volume of about 170 vpd. The vehicle count information indicates that this can be directly attributed to the higher number of heavy vehicles using the road over that time to transport coal to Ikamatua, as a result of the rail line closure for tunnel repairs.

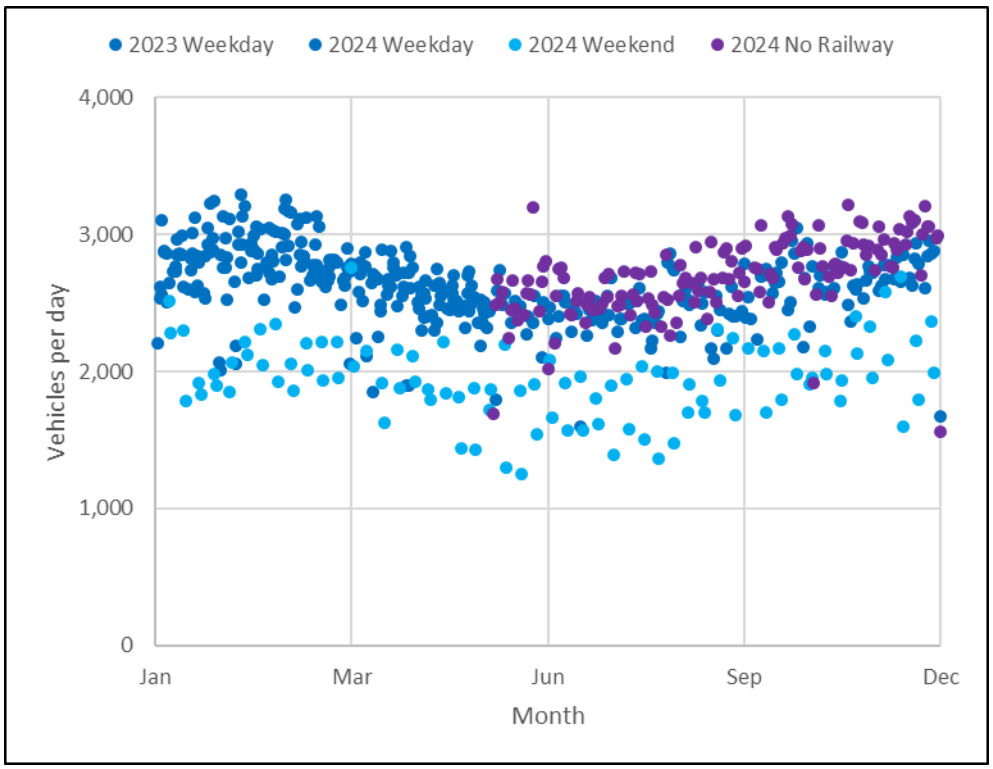

Figure 3-4: Daily traffic volumes 2023-2024 – SH67 North of Orowaiti River (Source: NZTA 06700009)

Figure 3-5 shows the hourly variation in traffic volumes on SH67 in early October 2025. There are clear differences in the volumes on weekdays compared with the weekend. On weekdays, the traffic volumes rise from the early morning to a broad peak from about 9:00 AM to 5:00 PM of about 200 to 220 vehicles per hour (vph). There is some evidence for work-based travel patterns with small peaks in the travel volumes at 8:00 PM and in the mid to late afternoon period. The weekend volumes show a late morning peak of about 220 vph but then fall gradually for the rest of the day. Overall, the traffic volumes are well below the traffic carrying capacity of the highway.

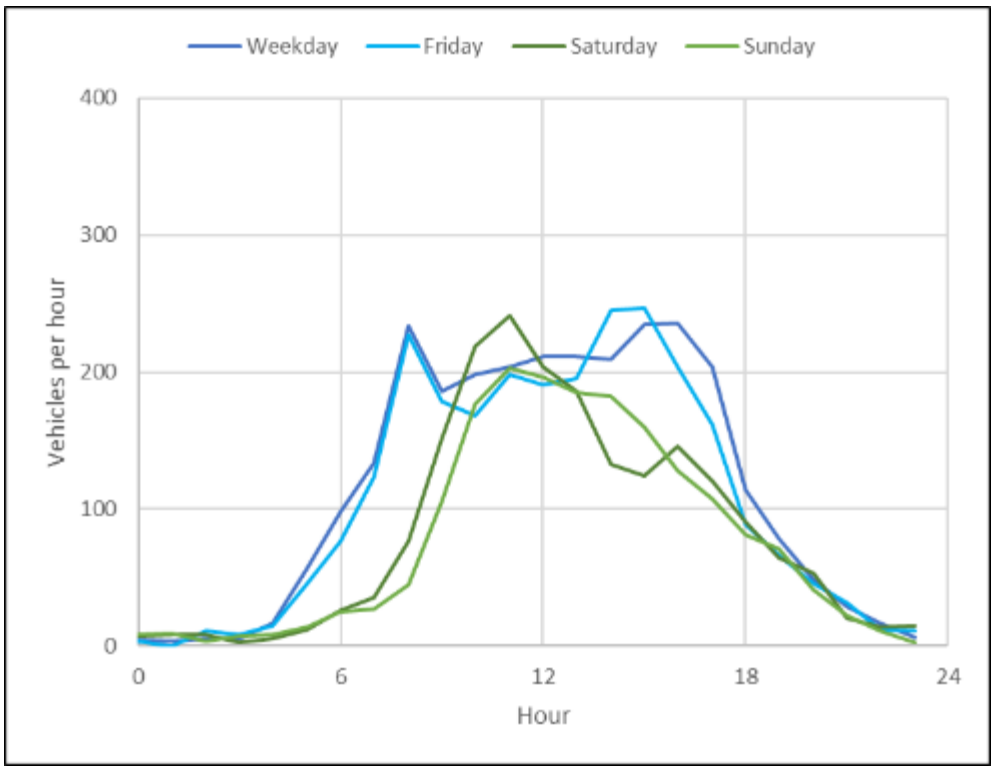

Figure 3-5: Hourly variation in traffic volumes - SH67 North of Orowaiti River (Source: NZTA 06700009)

3.5 Road Safety Record

The NZTA Crash Analysis System has been used to review the nature and number of crashes that have been reported on SH67 between Hector (north of Granity) and Westport. Over the five year period 2020 to 2024, there were 38 reported crashes with two crashes causing serious injuries and seven crashes causing minor injuries. No injuries were reported for the other crashes. There have been four crashes reported in the ten month period, January to October in 2025.

The majority of crashes involved a single vehicle only and were a consequence of the driver losing control of their vehicle while turning. Excess speed and alcohol were identified as contributing factors in several crashes.

Figure 3-6 shows the locations of all reported crashes for the 2020 to 2024 period. One serious injury crash involved a novice motorcyclist who lost control of the motorcycle turning into SH67 from McGill Street. The other serious injury crash occurred when a vehicle left the road and collided with a parked vehicle. This crash was attributed to driver impairment due to drugs and alcohol.

Six of the minor injury crashes involved a single vehicle only when the driver has left the carriageway. There were a wide variety of factors that contributed to each of the crashes. One minor injury crash involved a cyclist that was potentially intoxicated and turned across the path of a following vehicle. The other minor injury crash involved a pedestrian who walked into the carriageway without due regard for the traffic.

None of the reported crashes involved trucks.

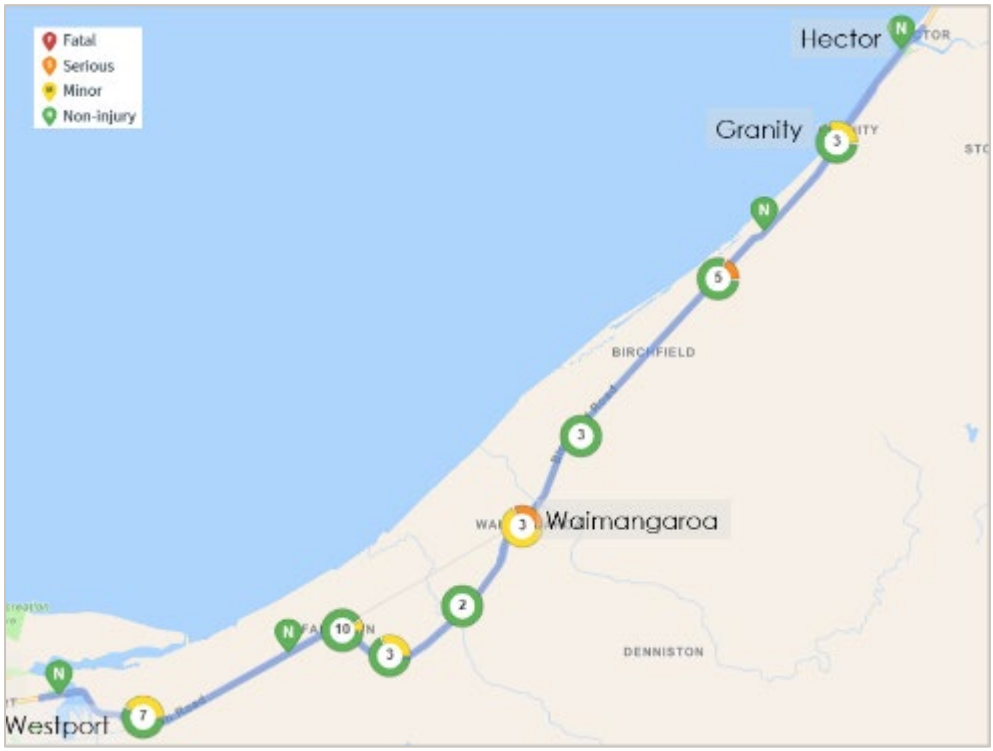

Figure 3-6: Crash Locations, 2020-2024 (Source: NZTA Crash Analysis System)

3.6 Safe System Comments

SH67 between Westport and Waimangaroa comprises a series of generally straight and level sections of road linked by moderate radius curves. The straight alignment will contribute to drivers adopting high speeds consistent with the rural open road environment which will result in greater severity injuries in the event of a crash. The high speeds are likely to be a contributing factor to crashes at or close to the curves which have signposted advisory speeds of less than 100 km/h.

The narrow shoulders provide little opportunity for a driver to return to the carriageway if they stray from the traffic lane which increases the risk of run-off road type crashes. The shoulders include sections with significant hazards in the form of deep drains and trees.

The carriageway widths are not generous but provide sufficient space for two-way movement of trucks. The generally straight alignments reduce the risk of head-on collisions.

It has been noted during site observations that many of the signs along the highway are old, have poor reflectivity and have been poorly maintained. One consequence is that the effectiveness of the advance warnings will be reduced, particularly in low light conditions. This is reflected to some extent in the number of crashes that have occurred at small radius curves.

4 Denniston Plateau Access

4.1 Description

Figure 4-1 shows the vehicle access route to the Denniston Plateau from SH67 comprises several roads which form a single route, collectively referred to as the 'Denniston Track'. The road ascends nearly 600 m over a distance of 8 km between Waimangaroa and Denniston. McGill Street and Banbury Street in Waimangaroa form the northernmost section of the Denniston Track, with Banbury Street then continuing as Denniston Road through to Denniston. Denniston Road meets Boswell Street (at Denniston) and Burnetts Face Road at an uncontrolled intersection with the priority being for movement between Denniston Road and Burnetts Face Road. Boswell Street provides access to the visitor car park for the Denniston Historic Reserve and walking tracks.

Figure 4-1: Denniston Track

The urban section of the Denniston Track (McGill Street and Banbury Street) has been formed as an 8 to 9 m wide, two-lane, two-way carriageway with centre-line markings and has a footpath on one side of the road only, as shown in Photograph 4-1. "No stopping" lines have been marked against the footpath side of the road.

Denniston Road ascends with a moderate gradient from Waimangaroa, typically about 7% but with some sections exceeding 12%. The carriageway has a typical width of about 6.8 m and has a marked centre line with intermittent edge lines (Photograph 4-2 and Photograph 4-3). The carriageway width varies along the road and localised widening has been provided at some curves. However, there are sections where the carriageway is narrower than 6.8 m.

There are many locations with steep drops to the side of the road which are unprotected (Photograph 4-4). There are also steep sided drains alongside many parts of the road which would generally be unrecoverable if a vehicle wheel entered the drain (Photograph 4-5).

Photograph 4-2: Denniston Road - Typical Formation

Photograph 4-3: Denniston Road – typical formation

Photograph 4-4: Denniston Road - Unprotected, steep drop-off

Photograph 4-5: Denniston Road - unrecoverable drain

Boswell Street meets Denniston Road / Burnetts Face Road as the minor road at an uncontrolled intersection. There are no limit lines on Boswell Street and the centre line marking creates potential

confusion for drivers because of its poor alignment. There is no destination signage opposite the Boswell Street approach to inform drivers of directions to their destination (Photograph 4-6).

Photograph 4-6: Boswell Street approach to Denniston Road

The Denniston Track continues as Burnetts Face Road from the Boswell Street intersection with the carriageway reducing in width to about 6.4 m. Whareatea Mine Road meets Burnetts Face Road about 800 metres east of Denniston Road at a give-way controlled intersection. The intersection has been marked with the Burnetts Face Road eastern leg marked as the minor road (Photograph 4-7).

Burnetts Face Road narrows east of the intersection and provides access to historic mining areas beside the upper reaches of the Waimangaroa River.

Whareatea Mine Road has been formed with an approximately 6.5 m sealed carriageway for a distance of about 500 m (Photograph 4-8) and then continues as a gravelled road (Photograph 4-9). The end of the seal represents the limit of the public road. There is an informal car park beside the road that is utilised as a base for mountain bikers to access the tracks that have been constructed across the plateau to the east.

The gravelled road provides access to the existing Escarpment Mine to the south.

Photograph 4-7: Burnetts Face Road / Whareatea Mine Road Intersection

Photograph 4-8: Whareatea Mine Road - Typical formation

4.2 Traffic Volumes

Figure 4-2 shows the average daily traffic (ADT) volumes on Denniston Road recorded by Bathurst west of the Boswell Street / Burnetts Face Road intersection. Average two-way volumes are about 80 vpd but can exceed 200 vpd in the busiest weeks of the year. The traffic volumes predominantly reflect recreational demands as currently there are no active mining operations on the Denniston Plateau.

Figure 4-3 shows the daily traffic volumes recorded on Denniston Road in 2024. This shows the highest volumes being recorded during the summer period, January to March, with the lowest volumes occurring during the winter months. Although the daily traffic volumes on weekdays and weekends show similar variations across the year, traffic volumes at weekends are generally higher than during the week. The average weekend volume was about 90 vpd compared with a weekday average of about 70 vpd. The 90th percentile volume which typically reflects the five busiest weeks of the year, was 170 vpd at weekends compared with less than 120 vpd on weekdays. Daily traffic volumes exceeded 200 vpd on nine days of the year with six of these being during the peak Christmas to New Year holiday period. This reflects the higher number of visitors to the Denniston Historic areas and mountain bike tracks during the summer. High traffic volumes are also common on holiday weekends.

Figure 4-2: Denniston Road ADT 2018-2024 (Source: Bathurst)

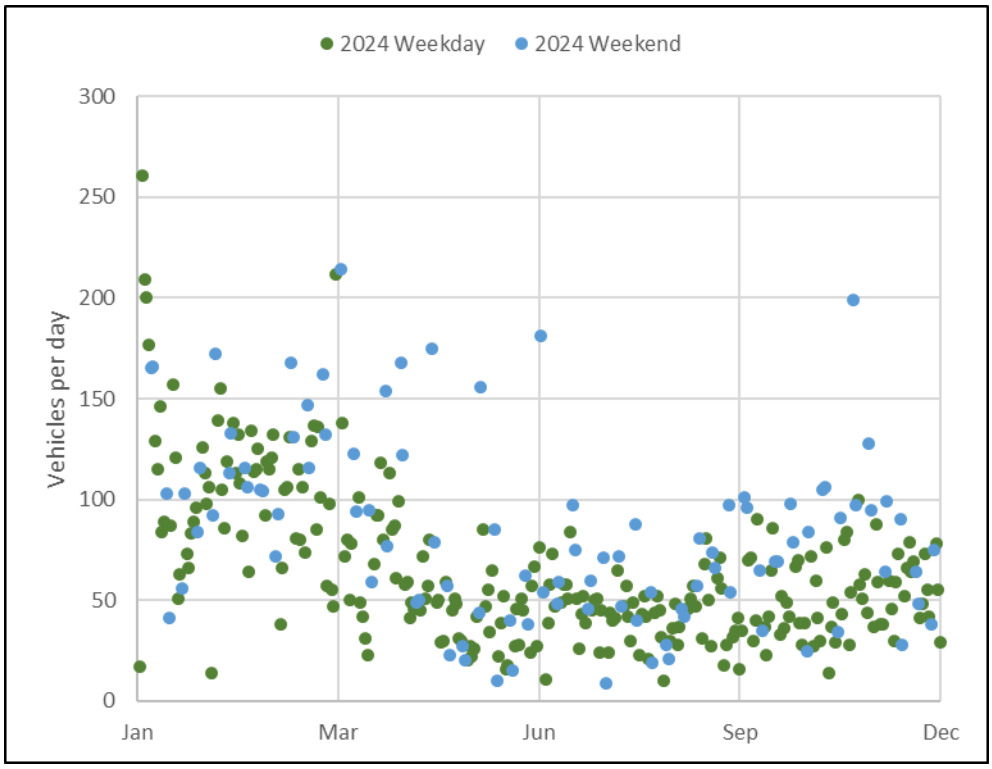

Figure 4-3: Seasonal variation in traffic volumes on Denniston Road – 2024 (Source: Bathurst)

Table 4-1 provides a summary of the daily traffic volumes on Denniston Road and on the plateau that have been recorded by Bathurst from January to December in 2024. Although daily volumes on Burnetts Face Road are relatively low, the 90th and 98th percentile volumes clearly indicate the higher level of use during the busiest weeks of the year. Cyclists are present throughout the year on the plateau due the presence of the mountain bike tracks, although these are at low volumes. (Additional detail on recreational use of the area is provided in a separate report.)

Table 4-1: Daily vehicle volumes – 2024 (Source: Bathurst)

Location	All vehicles		
	Average	90th %	98th %
Denniston Road	73	131	206
Burnetts Face Road	11	34	65

Figure 4-4 shows the hourly variation in traffic volumes recorded on Denniston Road over a weeklong period in February 2024 which represents typical summer demands. Hourly volumes during the week were below 15 to 20 vph but reached 30 to 40 vph on Saturday and 20 to 30 vph on Sunday. This pattern reflects the recreational demands that are being generated by the Denniston historic area and mountain bike tracks.

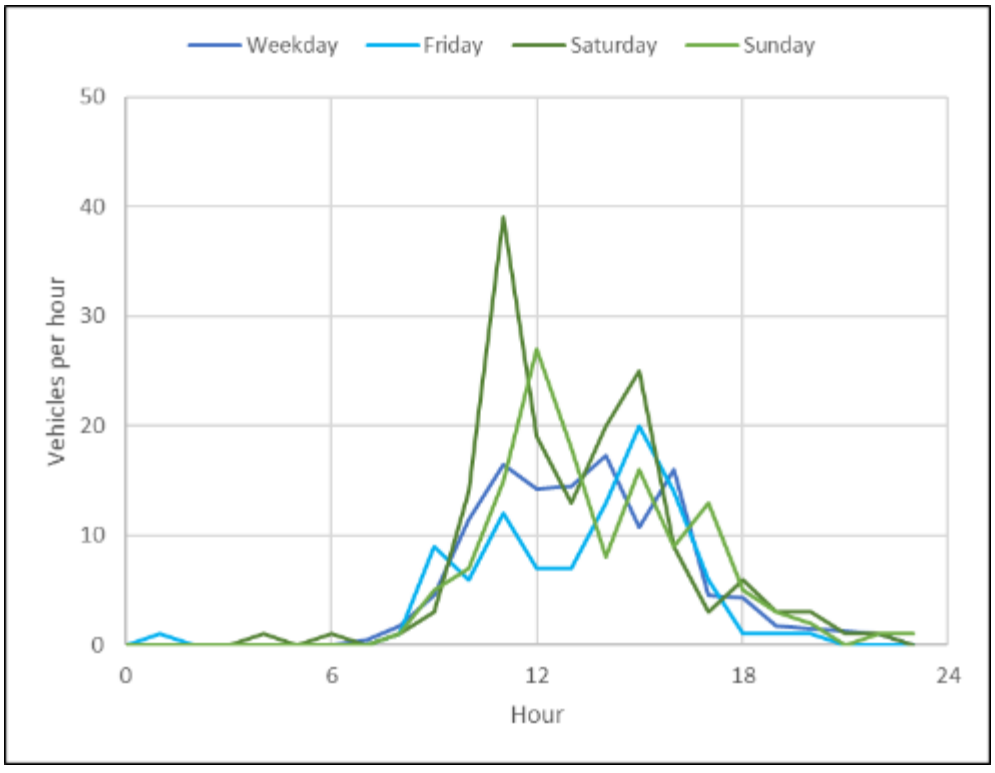

Figure 4-4: Hourly volumes on Denniston Road - February 2024 (Source: Bathurst)

4.3 Road Safety Record

4.3.1 Reported Crashes

The NZTA CAS includes only one crash report on the Denniston Track in the ten-year period 2015 to 2024. No crashes have been reported in 2025. It is considered likely that this reflects the low volume of road users rather than being indicative of the safety characteristics of the road. The single crash involved a motorcyclist who lost control on a corner as they descended the road and caused serious injury to the rider.

4.3.2 Safe System Assessment

Appendix A includes a tabulated summary of the Safe System assessment (SSA) rating for the Denniston Track.

The existing scenario generates a SSA score of 36 out of 448. The low rating score is largely a reflection of the low traffic volumes rather than lack of hazards on the road.

There are multiple hazards on the road that could increase the severity of injuries in the event of a crash. These include:

- Moderate road gradients that contribute to high downhill speeds;
- Small radius corners, often with restricted visibility of approaching vehicles;
- Steep, unprotected drops;
- Steep, unrecoverable roadside drains; and,
- Narrow sections of carriageway.

The likelihood of a crash occurring is mitigated to some extent by the low operating speed of the road (approximately 40 km/h) as well as the low volumes which are generally below 30 vph.

Construction Effects

5 Buller Plateaux Continuation Project

5.1 Construction Activity

Escarpment Extended as a whole broadly comprises two distinct groups of activities with different travel demands. The initial stage of activity includes the site establishment and construction of the proposed UWHR. This is expected to take about two years to complete. The production activity at Escarpment Extended will begin only once the site establishment and the UWHR construction works are complete. [redacted]

[redacted]

[redacted]

The actual number of daily trips will vary widely from week to week because this will be determined by the stage of construction. Construction staff movements will typically form the largest proportion of the movements and is expected to require up to 30 combined bus and light vehicle two-way trips per day (i.e. 30 movements in and 30 movements out). Staff will typically arrive in the early morning and depart in the late afternoon.

Material deliveries for the mine infrastructure (buildings and facilities) and the UWHR are expected to involve about 10 to 15 deliveries by heavy vehicle per day on average based on a 7 day working week. This will predominantly comprise large articulated trucks (truck and trailer combination or semi-trailers) rather than rigid trucks. Concrete pours for foundations will involve higher volumes of rigid truck movements on a smaller number of days. These would typically occur early in the day.

Since the construction activity is expected to take place over approximately 10 hours per day, the average hourly volume of construction vehicles excluding staff vehicle movements during the day is expected to be less than 5 vph. Since the movements will not be evenly distributed across the day, a peak volume of 5 vph has been adopted for this assessment. Staff vehicle movements are expected to generate up to 30 vph to the construction site early in the morning, before 7:00 AM, with departures occurring in the late afternoon, after 4:00 PM.

Based on the likely vehicle types required for the construction material deliveries, it is expected that apart from concrete trucks, the majority of other mine deliveries would be with articulated vehicles. This means that large heavy vehicles could account for about 20% of all movements on the Denniston Track during the day.

6 Expected Construction Traffic Effects

6.1 Overview

The construction works associated with the formation of the UWHR and establishment of mining facilities are expected to generate up to 60 worker vehicle movements per day and typically 20 to 30 heavy vehicle movements per day. Days with a concrete pour will generate higher volumes of truck movement but these will be single unit trucks rather than articulated trucks. Concrete pours would normally be planned for the early morning and completed before midday. Peak hourly construction volumes of up to 30 vph can be expected early in the morning and late afternoon as workers arrive on site and subsequently leave.

During the day, the additional vehicle movements and specifically the high proportion of heavy vehicles will contribute to two primary effects on the recreational users of the Denniston Track. Firstly, since heavy vehicles will travel more slowly than recreational traffic, the movement of recreational traffic both up and down the road is likely to be delayed due to the lack of safe passing opportunities. Secondly, although the Denniston Track has sufficient width to accommodate two-way movement of light vehicles and smaller heavy commercial trucks, there are sections of carriageway and small radius curves where two-way movement of light vehicles in conjunction with a large articulated vehicle will not be possible.

6.2 Heavy Vehicles

Although the Denniston Track has sufficient carriageway width to accommodate two-way movement of a rigid truck and light vehicles, there are multiple locations where this is not possible for longer articulated vehicles because of the small radius of many curves. Appendix B includes diagrams showing vehicle tracking paths of a fuel tanker in the most constrained locations which indicates that this will need to utilise the full width of the carriageway to negotiate some curves. Appendix C and Appendix D show vehicle tracking paths for truck and trailer units and large rigid vehicles respectively.

The delivery of the mining vehicle fleet is expected to occur towards the end of the overall construction period. Since some of the mining vehicle fleet could be transported up the Denniston Track using specialist vehicle transporters, Appendix E provides indicative tracking for the widest load that is anticipated. Accommodating the larger load widths which could be similar to the carriageway width may require removal or pruning of trees / branches that are close to the carriageway edge. As the vehicles will be over-dimension, their movement on the road network will require special permits and a specific traffic management plan.

6.3 Travel Delays on Denniston Track

Construction vehicle movements for the Escarpment Extended mine and UWHR will occur during the day and will involve both rigid trucks and articulated vehicles. Average heavy vehicle volumes of 5 to10 vph are expected throughout the day which will affect the movement of light vehicles.

The Denniston Road section of the Denniston Track is approximately 8 kilometres (km) long and the operating speed for the road is about 40 km/h. This means that it would typically take about 12

minutes for a visitor to travel between Waimangaroa and the top of Denniston Road. The travel time for a truck and trailer unit is expected to be slower due to the grade of the road, the direction of travel and whether or not it is loaded. Since a laden truck may only be able to maintain an average speed of 20 to 25 km/h travelling uphill, it could take up to 24 minutes to reach the top of Denniston Road. Although the downhill truck speeds are likely to be higher, they are expected to travel more slowly than light vehicles because of the moderate to steep grades along the road.

Visitors to the Denniston Plateau will currently be able to travel up or down Denniston Road with negligible delay being caused by other road users because all vehicles would be expected to travel at similar speeds. Since the morning construction peak travel demand is expected before 8:00 AM, there will be little conflict with recreational visitors as these only start to arrive later in the day. During the day, the construction activity could generate about 5 vph on the Denniston Track with these predominantly being large, heavy vehicles.

The probability of a light vehicle catching up with a heavy vehicle in either the uphill or downhill direction will depend upon the truck speed and volumes compared with the visitor vehicle speed. If an unladen truck is able to travel at an average speed of 30 km/h which represents an average truck travel time of 16 minutes, there is about 20% probability of a light vehicle catching up with the truck.

Since there are limited opportunities for passing along the road, a light vehicle may need to follow the heavy vehicle either to the top or bottom of the road. This could add up to 4 minutes of travel time to the journey of the light vehicle with an average of about 2 minutes.

In practice, laden trucks may only be able to maintain a speed of 20 to 25 km/h which could increase their average travel time to more than 20 minutes. This would increase the likelihood of a light vehicle catching up a heavy vehicle to more than 33% and the associated average travel delays could increase to over 5 minutes.

Full mitigation of this effect would involve the provision of slow vehicle lanes on Denniston Track. However, given the extent of widening required to provide slow vehicle lanes in accordance with recommended design standards and the generally low traffic volumes, this option is not considered practical because of the steep topography and extent of earthworks that would be involved.

The preferred approach involves forming widened shoulder areas wherever practical to allow slow vehicles to pull over so that faster vehicles can pass. Appendix F shows locations where pull-over areas could be formed without the need for extensive earthworks. The locations have generally been selected to make use of existing, partially formed wide shoulders that allow sufficient space for large vehicles to pull over so that faster vehicles can pass.

6.4 Two-way movement Conflicts

With the very low volumes of heavy vehicles currently using Denniston Road, the probability of a light vehicle meeting a heavy vehicle travelling in the opposite direction is very low. Since the construction activity will increase the volume of heavy vehicles on the road, the probability of a light vehicle meeting will increase significantly.

Since it will typically take 10 to 12 minutes for a light vehicle to travel between Waimangaroa and Denniston, the probability of an individual light vehicle meeting a heavy vehicle is estimated to be

about 40% based on a two-way truck volume of 5 vph. As the heavy vehicle travel time is expected to be much longer than for a light vehicle and light vehicle volumes are higher than heavy vehicle volumes, an individual heavy vehicle could expect to encounter up to three vehicles travelling in the opposite direction somewhere along Denniston Road. While the width of the Denniston Track is sufficient to accommodate two-way movement of a light vehicle and a rigid truck, there is insufficient width at the smaller radius curves to accommodate two-way movement of a large articulated truck and light vehicle or two rigid trucks because the truck will need to cross the road centre line.

On the most winding section of road, which is about 4 km long, an articulated vehicle could expect to meet one or two vehicles travelling in the opposite direction. Based on the forecast truck volumes, passing movements could be occurring three to four times an hour. If the opposing vehicles meet within or close to the smaller radius curves, one or both vehicles may need to stop and possibly reverse to create space for the other vehicle. Since the construction works will involve multiple deliveries every day with articulated vehicles, conflicts will be a regular occurrence. If drivers are not alert to the potential conflict, it could contribute to a higher risk of head-on type crashes or run-off road type crashes if drivers need to take evasive action or leave the road when manoeuvring. The injury consequence in the event of these types of crashes could range from minor to serious, particularly if a vehicle went off the road and down a steep drop. On that basis, mitigation of the risk of crashes is required. There is also a risk that this could deter visitors from travelling to Denniston.

One potential mitigation option for this risk would involve widening the carriageway at all small radius curves to provide sufficient width to accommodate two-way movement of an articulated vehicle and rigid vehicle. Since this would involve either large scale earthworks and potentially significant re-alignment of the road, this is not considered practical or justified by the low volumes of road users but does represent a desirable long term outcome.

Another potential mitigation option could involve the use of pilot vehicles to control the movement of opposing traffic on the more tortuous sections of road or installing temporary signals to restrict movements to one way. Both of these options will create travel time delays for all road users and would be impractical for the volume of construction vehicles anticipated during the day.

A further option would involve sections of the road being managed to restrict movements to one-way only. Where visibility is available from each end of a restricted section of road, movement priority signage could be implemented. However, given that visibility is generally not available from each end of the narrower sections of road or curves, it would be necessary to implement active controls such as signals. While this may be appropriate for a short period of time, it is not considered appropriate over a year-long construction period because it would require multiple sets of signals and introduce long delays for all road users.

Bathurst has previously adopted a communications system for all of its vehicles and service providers that required drivers to use radios to broadcast their position and the positions of other road users so that they could manage the risk of conflicts arising as vehicles travelled up or down the Denniston Track. It is understood that this system was successfully operated for two years during the construction phase of the existing Escarpment Mine without any safety concerns being raised. The system was reliant on trucks moving off the carriageway where practical to either wait or allow vehicles to pass. The pull-over areas were not sealed. This approach to managing mine related vehicle movement represents an appropriate level of control for the construction works but will be reliant on shoulder widening being provided where practical along the Denniston Track to minimise

the risk of conflict between opposing vehicle movements. Indicative locations for widening are included in Appendix F.

Managing the movement of articulated vehicles and detailing the expected level of communication will need to form part of the Project's Traffic Management Plan (TMP). It is expected that with well managed communication protocols, the movement of construction vehicles can be accommodated safely but it is recommended that designated pull-over areas for trucks are constructed.

6.5 Burnetts Face Road and Whareatea Mine Road

Burnetts Face Road has a sealed carriageway width of 5.8-6.4 m between Denniston and Whareatea Mine Road. At this width, two-way movement of large trucks requires passing at low speed and/or potentially using the adjacent berms. Since the typical width of a truck is nearly 3 m inclusive of wing mirrors, a minimum sealed carriageway width of 6.6 m is typically desirable on straight sections of road carrying moderate heavy vehicle volumes, with additional widening provided at curves.

Since two-way volumes on both Burnetts Face Road and Whareatea Road are lower than on Denniston Road, the likelihood of two large vehicles meeting will be much lower. Although this can largely be managed using driver communications, there are two curves where some widening may be necessary to reduce the potential for edge break on the inside of the curve: the Burnetts Face Road / Whareatea Road intersection and the small radius curve about 350 m south of Denniston.

Whareatea Mine Road has a typical width of 6.2 m which would also not readily accommodate two-way truck movement without the use of the berms, which will likely contribute to edge break over time. However, with the low volumes of trucks using this section of road, the need to accommodate two-way movement will be infrequent and could be managed using driver communications.

6.6 Denniston Road / Burnetts Face Road / Boswell Street

The Denniston Road / Burnetts Face Road / Boswell Street intersection is poorly marked and does not provide a clear indication of movement priorities. It is understood that this contributes to confusion for visiting drivers. It is recommended that new signs and marking are installed to clearly identify the priorities and reduce the risk of a crash, broadly as indicated in Figure 6-1. These improvements are recommended regardless of whether or not the BPCP proceeds.

Figure 6-1: Denniston Road / Burnetts Face Road / Boswell Street intersection improvements

6.7 Denniston Track Pavement

The volume of construction vehicles using the Denniston Track is likely to contribute to increased wear and damage to the road pavement. Regular monitoring of the road condition will be required with repairs being implemented promptly to reduce the risk of more extensive damage or a crash. Since the road is controlled by the Buller District Council (BDC), it is recommended that a maintenance and repair plan is agreed to by Bathurst and BDC.

6.8 State Highway 67

Since SH67 forms part of the designated HPMV road network, its use by trucks represents an anticipated activity. The addition of construction vehicle movements to SH67 between Waimangaroa and Westport could increase average daily volumes by about 90 vpd to about 3,000 vpd (3%). Even with this increase, the daily volumes on this section of the road network remain low and well within the capacity of the road.

6.9 Rail Network Effects

During the construction phase, there will be no changes in the traffic volumes at the railway crossings north of Waimangaroa. The construction works could increase daily volumes at the SH67 / Beach Road crossing by 90 vpd to about 3,000 vpd. Based on the existing fluctuations in daily traffic volumes, this is not expected to contribute to any noticeable change in risk on the operation of the crossing.

6.10 Road Safety

The primary road safety effect relates to the higher volume of heavy vehicle movements that will be present on the Denniston Track and on SH67 between Waimangaroa and Westport.

The most significant risk relates to the increased potential for conflict between light vehicle movements and articulated trucks, particularly along the more winding section of the Denniston Track. Managing the movement of articulated vehicles either through a road improvements plan or other controls will need to form part of the TMP.

The narrow sections of carriageway on the Denniston Track will increase the risk of head-on collisions or drivers needing to take evasive action leading to run-off road type crashes. While any crashes are expected to be at low to moderate speeds, the injury consequences could be high because head-on crashes could involve a heavy vehicle and because of the steep unprotected drops if a vehicle left the road.

Since the long-term operation of Escarpment Extended mine will still involve the movement of articulated vehicles on the Denniston Track, it is recommended that improvement works are undertaken when it is practical as part of the general maintenance and repair programme. The potential improvement works include widening of the carriageway on Denniston Track and reshaping of roadside drains to ensure that they have recoverable edges.

For the construction stage and subsequent operational stage, it is expected that the communication protocols that were previously established for the construction of the existing Escarpment Mine will mitigate the risk of crashes to an acceptable level. For this system to operate effectively, it is recommended that formal pull-over areas for trucks are created to enable passing by faster vehicles and to assist with managing conflicts along the more tortuous sections of the road.

The detailed communication protocols for managing the movement of articulated vehicles will need to form part of the TMP.

6.11 Summary of Recommended Mitigation Measures

The primary control during construction for managing the effects of mine related traffic on the general public will be implementation of driver communication protocols to reduce the risk of two-way movement of a truck and light vehicle occurring on the most tortuous or narrow sections of road. This system is reliant on drivers communicating details of oncoming traffic followed by trucks moving off the carriageway where practical to either wait or allow oncoming or passing vehicles to pass. For the communications systems to operate effectively, it will need to be supported with the following improvements to the public road network.

Denniston Track

1. Construction of wide shoulders to provide opportunities for slow vehicles to pull over clear of the traffic lane. (Indicative locations are shown in Appendix F). The locations of wide shoulder areas will be confirmed as part of the TMP.
2. New road marking and signage at the Denniston Road / Burnetts Face Road / Boswell Street intersection.

3. Maintenance and repair to the road pavement to ensure that the road remains safe for all road users.

Burnetts Face Road

4. Widen Burnetts Face Road at small radius curves between Denniston and Whareatea Mine Road to provide a minimum sealed carriageway width of 6.6 m.

Whareatea Mine Road

5. Widen the sealed carriageway at the Whareatea Mine Road / Burnetts Face Road intersection to enable two-way movement of trucks.

With the implementation of the TMP (see Section 7) inclusive of the driver communication protocols and these improvements to the transport network, it is considered that the mine related construction traffic will not contribute to adverse safety effects on the transport network.

7 Traffic Management Plan

7.1 Purpose

Bathurst has previously developed a Construction Traffic Management Plan (CTMP) for the construction of the existing Escarpment Mine. This plan generally remains applicable for Escarpment Extended. One key difference is that the volume of large, articulated trucks using the Denniston Track will be lower with Escarpment Extended than was anticipated for the earlier Escarpment Mine operation because coal, once mined, will now be transported via the UWHR to the Stockton Mine rather than down the Denniston Road. During the Escarpment Extended mine construction phase, truck volumes are expected to be comparable to those anticipated during the construction of the existing Escarpment Mine.

The Project's Traffic Management Plan (TMP) will form a key component for managing the traffic effects, primarily the slow movement of large trucks on the Denniston Track. It will need to be prepared with input from Bathurst in consultation with stakeholders including BDC. The TMP will need to be submitted to the BDC for approval before any recommended or required physical works begin.

Copies of the TMP will be prepared to keep stakeholders including residents close to the construction vehicle access routes fully informed of how Escarpment Extended will affect the roads they use. This document should be maintained in electronic form as it will be a live document and will need to be updated to incorporate changes such as variations to the project schedule. It is anticipated that a Community Liaison Group would be established so that the community can provide feedback on the effectiveness of the TMP and identify any potential alterations to reduce effects on the community. Updates on Project progress and planned works that will affect the community should be provided on a regular basis.

The TMP will provide stakeholders with a clear understanding of the construction programme, expected traffic volumes during each stage including the need for transporting over-weight or over-dimension loads, any road improvements to be undertaken, and the traffic management measures being implemented such as temporary or mobile road closures.

The TMP will include details of:

a) site access arrangements;

b) construction programme and construction activity time restrictions;

c) traffic volumes;

d) management plan for oversize loads (numbers and transport times);

e) driver protocols;

f) road improvements;

g) pavement maintenance;

h) monitoring; and

i) communication / complaints arrangements.

Details of the anticipated content is described below.

7.2 Site Access Routes

The first part of the TMP will provide details of the wider transport network surrounding the Escarpment Extended site, the vehicle access locations to the site and the routes that will be taken by construction vehicles. This would normally comprise a more succinct version of information contained in this transportation assessment report.

7.3 Construction Programme and Traffic Volumes

The TMP will provide details of the expected volumes of construction traffic on the various parts of the transportation network and also times of movements. It will provide the detailed schedule of the various work stages as the construction process proceeds. From this, the various parties will be able to confirm and understand the type and frequency of vehicles to expect on each portion of route at any time during construction.

7.4 Over-weight and Over-dimension Loads

Operation of the mine will require a variety of over-weight and over-dimension loads to be transported to Escarpment Extended via the Denniston Track. Over-weight and over-dimension loads create very specific transport management requirements which will need to be addressed separately from the general construction traffic movements.

Although it is anticipated that specialist contractors will be engaged to transport the over-weight and over-dimension loads and that they would operate under specific permits for the project, the TMP should outline what could be expected. This would typically include.

a) transport routes;

b) confirmation of the times and locations when movement is prohibited, for example peak hours on SH67, and an indication of the times of day when deliveries are anticipated;

c) operating restrictions for any bridge or railway crossings;

d) piloting procedures;

e) contingency plans for breakdowns, bridge or pavement failures, severe weather conditions, accidents, or roadworks;

f) provisions for co-ordination with other parties, including emergency services; and

g) provisions for communication with school bus drivers if any day-time transport of over-weight or over-dimension loads is required.

Including these details in the TMP will assist regular road users in knowing how to respond to the presence of piloted oversize loads.

7.5 Driver Protocols

In addition to the driving standards required by law, all drivers involved in Escarpment Extended will be subject to additional protocols when travelling along the district roads. This could include:

a) travel speeds on unsealed roads; and,

b) restrictions on traffic movements to reduce effects on recreational visitors to Denniston.

These protocols will be strictly enforced by the consent holder in addition to all other aspects of on-site health and safety.

7.6 Road Improvements

Since some localised improvement works have been identified for the Denniston Track to accommodate the higher volumes of truck and trailer movements, it will be necessary for Bathurst to prepare and submit to the relevant Road Controlling Authority (RCA) an appropriately detailed schedule describing the works and the temporary traffic management provisions to be put in place during construction. It is noted that, in this regard the Local Government Act prohibits anyone from making improvements to a road without the express approval of the RCA, either the relevant District Council for council roads (BDC) or NZTA Waka Kotahi for works on the state highways.

The Denniston Track does not allow for two-way movement of trucks along their full length and some works will be necessary to form passing areas. The TMP will set out the driver communication protocols for managing conflicts between mine related vehicles and the general public.

The design process for any works will include such geotechnical investigations as are necessary to satisfy the RCA that batters will remain stable. Once the designs have been approved by the RCA, they will be incorporated into the overall TMP, with details of:

a) the physical extent and nature of the works;

b) an accompanying schedule of start and finish dates;

c) details for sourcing materials and disposal of spoil;

d) provisions for advisory signage;

e) arrangements for temporary traffic management and supervision;

f) clean-up and overnight arrangements; and

g) contact telephone numbers.

Depending on the timing of these works relative to the overall project, this component of the TMP may be prepared and circulated in advance of the other planned works.

7.7 Pavement Maintenance

Bathurst proposes to establish a pavement maintenance agreement with BDC. During the construction and early operation phase, the focus of maintenance and repair work will involve

restoring the road to a safe condition and may involve temporary rather than permanent works. Some more permanent pavement rehabilitation may be required following the completion of construction works and the haul road being opened. In order to assess the scale of effect of the construction works, the TMP should detail when pre-construction and post-construction pavement condition surveys are undertaken.

7.8 Monitoring

The TMP will describe how construction vehicle movements on the public road network will be monitored and could include:

a) collecting actual traffic volumes in and out of the site on each access route;

b) ensuring safe pavement conditions are maintained, e.g. response and actions taken following reports of damage;

c) compliance with temporary traffic management plans; and,

d) collating submissions from the general public or Community Liaison Group.

The monitoring results will be reported to Council at regular intervals to be agreed with council, e.g. quarterly or monthly.

7.9 Communication Protocols

Communication protocols are fundamental to the success of the TMP. The names and contact details for the site manager(s) will be clearly recorded as the point of contact for all road users.

Provision will be made for the timing of oversize load movements or temporary road closures to be advertised through local media, enabling drivers to avoid them if they so choose.

A copy of the TMP will be available on the project website and will record a list of people and organisations that will be notified electronically of updates to the TMP. This is expected to include:

a) community groups in Waimangaroa, Granity, Ngakawau and Hector;

b) NZTA; and,

c) Buller District Council.

All amendments and updates to the TMP, as approved by Council, will then be forwarded to those named on the list.

Operational Effects

8 Buller Plateaux Continuation Project

8.1 Coal Production Phase

The production activity at Escarpment Extended will begin once the site establishment and UWHR construction works are complete. The production activity on the Denniston Plateau is expected to generate a similar level of vehicle movements to the existing volumes at the Stockton Mine. Table 8-1 provides a summary of the expected average weekday two-way trips (where a two-way trip includes the movement to the site and the movement from the site) on Denniston Track associated with the mining activity broken down by vehicle type: light vehicle (LV), heavy rigid vehicle (HCV) and large, heavy articulated vehicle (HCV2). It is understood that deliveries of fuel and other consumables to the mine will only occur on weekdays.

Based on the existing pattern of movements on Millerton Road which provides access to Stockton Mine, it is expected that there will be an early morning peak volume of about 40 vph with a similar volume of departing vehicles in the mid-afternoon (3:00 PM to 4:00 PM). During the day (7:00 AM to 2:00 PM), the mine is expected to generate up to 5 vph associated with a range of heavy vehicle types transporting materials to the mine. The majority of material deliveries for the mine will involve rigid vehicles but fuel deliveries are likely to be with an articulated truck. The fuel demands are expected to require three deliveries per day on average.

Bathurst will provide buses for staff travelling to the mine from Westport with staff travelling from areas to the north using private vehicles to travel to Waimangaroa with the option of using the bus between there and the mine site. Bathurst will provide an off-road parking area to reduce the need for any staff parking to occur on the local road network in Waimangaroa. Contractors and materials will typically be travelling from the south (Westport).

Under normal operating conditions, all coal will be transported from the Denniston Plateau to Stockton Mine via the UWHR for sorting and cleaning. Coal will then be transported from the Stockton Mine via an aerial ropeway system to the loadout facility in Ngakawau for onward transport by rail. The Ngakawau facility normally loads 19 trains per week over 6 days, that is, three outbound trains per day on average.

8.2 Abnormal Event Operation

8.2.1 Railway Closure

In the event of a railway closure between Ngakawau and Ikamatua, Bathurst will operate under a contingency plan that involves transporting coal by truck. In order to meet typical customer demands, Bathurst anticipates there could be a need to transport up to [redacted]. This could involve up to [redacted] travelling from Ngakawau to another train loading facility such as the one in Ikamatua with a similar volume of return movement. This could require up to about [redacted] based on 6 day working. It would not be expected to generate any additional vehicle movements on the Denniston Track.

Although the likelihood of this type of event is expected to be rare, the most recent closure of the railway in 2024 lasted for seven months.

8.2.2 Upper Waimangaroa Haul Road Closure

If the Upper Waimangaroa Haul Road was closed or obstructed for any reason that prevented the movement of coal to Stockton Mine's CHPP for an extended period of time, then it may become necessary to transport bypass coal to Ngakawau.

In this scenario, Bathurst anticipates a need to transport about [redacted] per month via the public road network from Denniston to Stockton. This represents up to [redacted]

The likelihood of this type of event is expected to be rare and short duration, typically measured in days rather than weeks.

9 Expected Transport Effects

9.1 Normal Production Conditions

9.1.1 Staff Travel

Under the normal production conditions, the mine is expected to generate a peak hour travel demand of about 40 vph in the early morning with a similar volume at the end of the working shift. The early morning arrival of workers does not coincide with the typical arrival times for visitors to Denniston. The peak afternoon travel demand will coincide with visitor movements to Denniston but will be strongly tidal towards Waimangaroa. On that basis, the buses used for staff travel will have little effect on other users of the Denniston Track.

Similarly to the construction works activity, the additional vehicle movements and specifically the high proportion of heavy vehicles during the day will contribute to two primary effects on the recreational users of the Denniston Track. Firstly, since heavy vehicles will travel more slowly than recreational traffic, the movement of recreational traffic both up and down the road is likely to be delayed due to the lack of safe passing opportunities. Secondly, although the Denniston Track has sufficient width to accommodate two-way movement of light vehicles and smaller heavy commercial trucks, there are sections of carriageway and small radius curves where two-way movement of light vehicles in conjunction with a large articulated vehicle will not be possible.

The primary difference between the construction and operational phases is that the operational phase involves much lower volumes of articulated vehicles but a higher volume of light and rigid heavy vehicles.

9.1.2 Travel Delays on Denniston Track

Service deliveries for the mine will occur during the day on weekdays and will involve both rigid trucks and articulated vehicles. It is anticipated that deliveries at the weekend may be required but would not be a regular occurrence. Average two-way heavy vehicle volumes of up to 5 vph are expected throughout the day which will affect the movement of light vehicles.

The effects on light vehicle travel times will be similar to those that will arise during the construction phase and will be influenced by the average truck speeds. If a truck can maintain an average speed of 30 km/h, average journey times for light vehicles could increase by up to 4 minutes if no provisions are put in place to enable trucks to pull over to allow a faster vehicle to pass. However, since laden trucks travelling uphill may only be able to travel at an average speed of 20 to 25 km/h, the effects on light vehicle travel times could be greater.

As with the construction works, the preferred approach involves forming widened shoulder areas wherever practical on the Denniston Track to allow slow vehicles to pull over so that faster vehicles can pass. Appendix F shows locations where pull-over areas could be formed without the need for extensive earthworks. The indicative locations have generally been selected to make use of existing, partially formed wide shoulders. No additional pull-over areas are considered necessary compared with the construction works phase.

9.1.3 Two-way movement Conflicts

With the very low volumes of heavy vehicles currently using Denniston Road, the probability of a light vehicle meeting a heavy vehicle travelling in the opposite direction is very low. Since the operational activity will increase the volume of vehicles on the road, the probability of a light vehicle meeting another vehicle will increase significantly.

Although the operational phase will involve less articulated vehicles, there are still sections of the road where there is insufficient space to accommodate two-way movement of a light vehicle and a medium or large rigid vehicle. It is recommended that the driver communication protocols established during the construction works are maintained for the operational phase. This would enable truck drivers to use widened shoulder areas as staging points to reduce the risk of any conflict arising with vehicles travelling in the opposite direction.

9.1.4 Burnetts Face Road and Whareatea Mine Road

Since two-way volumes on both Burnetts Face Road and Whareatea Road are lower than on Denniston Road, the likelihood of two large vehicles meeting will be much lower than on the Denniston Track. Again, and as with the construction phase, it is considered that the risk of two vehicles can be managed using driver communications.

9.1.5 Denniston Road / Burnetts Face Road / Boswell Street

The Denniston Road / Burnetts Face Road / Boswell Street intersection is poorly marked and does not provide a clear indication of movement priorities. It is understood that this contributes to confusion for visiting drivers. Improvements to the intersection are recommended regardless of whether the BPCP proceeds.

9.2 Denniston Track Pavement

The volume of mine related vehicles using the Denniston Track is likely to contribute to increased wear and damage to the road pavement. Regular monitoring of the road condition will be required with repairs being implemented promptly to reduce the risk of more extensive damage or a crash. Since the road is controlled by the BDC, it is recommended that a maintenance and repair plan is agreed to by Bathurst and BDC. It is suggested that this includes a long-term objective of improving safety through carriageway widening and improvements to roadside drains. The intent of this objective would be to inform decisions on potential safety improvements whenever any works are being implemented.

Bathurst currently collects vehicle movement volume information on the Denniston Track. Since this information can be used to inform decisions on the nature and timing for maintenance and repair works, records of vehicle movements should be made available to BDC on a regular basis.

9.3 Rail Network Effects

During the production phase, there will be no changes in the traffic volumes at the railway crossings north of Waimangaroa. The production activity could increase daily volumes at the SH67 / Beach Road crossing by about 220 vpd compared with the current situation. Although this represents a small increase in the daily volumes, it will have little effect on peak hour volumes because the movements are largely associated with staff travel which occurs outside the existing peak periods.

9.4 Road Safety

The primary road safety effect relates to the higher volumes of vehicle movements that will be present on the Denniston Track and on SH67 between Waimangaroa and Westport.

The most significant risk relates to the increased potential for conflict between light vehicle movements and articulated trucks, particularly along the more winding section of the Denniston Track. Managing the movement of articulated vehicles either through a road improvements plan or other controls will need to form part of the TMP.

Since the long-term operation of the mine will still involve the movement of articulated vehicles on the Denniston Track, it is recommended that improvement works are undertaken as part of the general maintenance and repair program. The improvement works should incorporate widening of the carriageway on Denniston Track and reshaping of roadside drains to ensure that they have recoverable edges wherever this is practical.

It is expected that the communication protocols that were previously established for the operation of the Escarpment Mine will mitigate the risk of crashes to an acceptable level. For this system to operate effectively, it is recommended that formal pull-over areas for trucks are created to enable passing by faster vehicles and to assist with managing conflicts along the more tortuous sections of the road.

The detailed communication protocols for managing the movement of articulated vehicles will need to form part of the TMP.

9.5 Abnormal Event Effects

9.5.1 Railway Closure

In the event of a railway closure between Ngakawau and Inangahua, it would be necessary for Bathurst to transport coal via road. This would not affect traffic volumes on the Denniston Track but could increase the daily traffic volumes on the state highway network between Ngakawau and Inangahua by up to 250 vpd with this increase all being heavy vehicles.

The majority of the affected sections of the state highway network are classified for HPMV use and generally carry volumes of 1,000 to1,500 vpd outside the larger urban centres of Westport and Reefton. Since the highways are intended to support freight transport and there are no capacity constraints along the highway, it is considered that the higher volume of truck movements could be accommodated without giving rise to adverse effects on the highway.

The section of SH67 between Ngakawau and Waimangaroa has not been classified as a HPMV route. While this section of highway has capacity to accommodate the higher volumes, the higher volume of heavy vehicles could contribute to more damage to the road surface. If the rail closure is expected to be for longer than one month, then it is recommended that the TMP includes road condition monitoring and measures to maintain the road in a safe condition while the railway is closed. An action plan for longer term repairs would need to be agreed with NZTA.

9.5.2 Upper Waimangaroa Haul Road Closure

If the UWHR cannot be used for coal transport for an extended period of time, it may be necessary to use Denniston Track and SH67 to transport coal to the train loading facility at Ngakawau. Bathurst have indicated that this could require transport of about 25 truckloads of coal per day which represents 50 additional truck and trailer movements per day. This will increase the level of conflict on Denniston Track and in particular, will require that two-way movement of truck and trailer units is managed to minimise the potential for conflicts. It is expected that this would require greater control of truck movements than would be required under normal production conditions. Potential mitigation options for this include:

1. Implementing temporary one-way movement controls using stop/go signs or signals. This approach would typically involve long signal cycle times, likely to be 20 to 30 minutes, because of the need to accommodate long clearance times.
2. Widening of the Denniston Track carriageway to allow two-way movement on large trucks along the full length of the road.

The first option would introduce travel time delays for all road users but is considered an appropriate approach to managing the temporary change in traffic conditions on the Denniston Track. The second option would enable the road to operate efficiently at all times with little effect on recreational users but involves extensive works on the road that would not be appropriate for managing a short term effect.

The first option represents the preferred approach because it allows for more dynamic management of demands and can be removed for overnight periods and weekends.

9.6 Summary of Recommended Mitigation Measures

The controls for managing the effects of mine related traffic on the general public during the operation phase are similar to those required for the construction phase. The controls include implementation of driver communication protocols to reduce the risk of two-way movement of a truck and light vehicle occurring on the most tortuous or narrow sections of road. For the communications systems to operate effectively, it will need to be supported with the same improvements to the public road network that were recommend for the construction phase.

It is recommended that Bathurst and BDC establish an agreement on a road maintenance and repair plan for the Denniston Track. While the focus of the plan will be to ensure that the road is maintained in a safe condition for all road users, it is recommended that it includes a long-term objective of improving safety with a progressive removal of safety hazards when opportunities arise. On that basis, it is recommended that safety improvements are included where practical as part of the implementation of any necessary road maintenance or repair works during the operational phase. The

types of safety improvements works that could be addressed include carriageway widening and upgrades to roadside drains to ensure that there are no unrecoverable edges within 0.5 m of the traffic lanes.

With the driver communication protocols and construction of widened shoulder areas to enable passing, it is considered that the mine related traffic will not contribute to adverse safety effects on the transport network.

The approach to managing any abnormal events will depend upon the nature of the event and its expected duration.

Conclusions

10 Conclusions and Recommendations

The Bathurst proposal to establish Escarpment Extended on the Denniston Plateau will increase vehicle movements on the Denniston Track. During the initial establishment phase which includes construction of the UWHR to connect Escarpment Extended with the Stockton Mine, this is expected to generate up to 120 additional vehicle movements per day on weekdays with up to 80 of these being heavy vehicles. Once the coal production phase begins, there will be lower volumes of truck movements but higher volumes of light vehicles. It is expected that the heavy vehicles will predominantly comprise single unit rigid vehicles rather than articulated vehicles or truck and trailers.

The additional vehicle movements and specifically the high proportion of heavy vehicles will contribute to two primary effects on the recreational users of the Denniston Track. Firstly, since heavy vehicles will travel more slowly than light vehicles, the movement of light vehicles both up and down the road is likely to be delayed due to the lack of safe passing opportunities. Secondly, although the Denniston Track has sufficient width to accommodate two-way movement of light vehicles and smaller commercial trucks, there are sections of carriageway and small radius curves where two-way movement of these vehicles in conjunction with a large articulated vehicle will be constrained. This will increase the risk of head-on crashes or vehicles leaving the carriageway.

Buller Plateaux Continuation Traffic Management Plan

Mitigation of the potential traffic effects will involve minor improvement works to the road network and implementation of driver communication protocols. It is recommended that a Traffic Management Plan is established for the establishment and operation of the Escarpment Extended mine to manage their implementation. The TMP should include details of:

a) site access arrangements;

b) construction programme and construction activity time restrictions;

c) traffic volumes (construction phase and operational phase);

d) management plan for oversize loads (numbers and transport times);

e) driver communication protocols;

f) any necessary road improvements;

g) pavement maintenance plan;

h) monitoring; and

i) communication / complaints arrangements.

Road Network Improvements

The following improvements to the public road network are considered to be necessary to provide for the safe function of the roads:

Denniston Track

1. Construction of wide shoulders where practical to provide opportunities for slow vehicles to pull over clear of the traffic lane. The locations of wide shoulder areas will be confirmed as part of the TMP.
2. New road marking and signage at the Denniston Road / Burnetts Face Road / Boswell Street intersection.
3. Maintenance and repair to the road pavement to ensure that the road remains safe for all road users.

Burnetts Face Road

4. Widen Burnetts Face Road at small radius curves between Denniston and Whareatea Mine Road to provide a minimum sealed carriageway width of 6.6 m.

Whareatea Mine Road

5. Widen the sealed carriageway at the Whareatea Mine Road / Burnetts Face Road intersection to enable two-way movement of trucks.

Denniston Track Maintenance Plan

It is recommended that Bathurst and BDC establish an agreement on a road maintenance and repair plan for the Denniston Track. Although the primary purpose of the plan will be to ensure that the road is maintained in a safe condition for all road users, it is recommended that it includes a long-term objective that supports safety improvements with a progressive removal of safety hazards when opportunities arise. The types of safety improvements works that should be considered include:

- options for carriageway widening and
- upgrades to roadside drains to ensure that there are no unrecoverable edges within 0.5m of the traffic lanes.

As part of the maintenance plan, it is recommended that Bathurst provides records of vehicle volumes on Denniston Track to BDC on a regular basis inclusive of a breakdown by vehicle type.

With the implementation of the TMP inclusive of the Denniston Track maintenance plan and improvements to the transport network, it is considered that the mine related traffic will not contribute to adverse safety effects on the transport network.

Appendices

Appendix A Safe System Assessment – Denniston Track

The Safe System audit methodology brings together the Safe System assessment and safety concern ratings into one report.

The Safe System assessment evaluates a project's alignment with Safe System principles and identifies ways to improve alignment with a focus on minimising fatal and serious injuries. It investigates the inherent risk of the infrastructure and includes consideration of road user exposure.

The safety concern ratings are to identify individual aspects of the project that are a concern with an associated risk profile as per the concern ratings matrix. The assessment matrix is used to determine the extent to which existing conditions and potential project options align with the Safe System principles. This is achieved through a scoring system which considers seven crash types and the exposure, likelihood and severity of injury associated with crash type. Each combination is assigned a score out of four. The exposure, likelihood and severity scores for each crash type are multiplied to give a product out of 64. These are then added to determine the total safe system assessment score with a maximum of 448.

A score of zero or close to zero indicates a high level of alignment with the Safe System principles with the level of alignment decreasing as the assessment score increases.

Table A-1: Existing Situation

	Run-off road	Head-on	Intersection	Other	Pedestrian	Cyclist	Motorcyclists
Exposure Comments:	Denniston Track – <200 vpd	Denniston Track – <200 vpd	Denniston Track – <200 vpd	Denniston Track – <200 vpd Low heavy vehicle volumes	Denniston Track - < 10 ppd	Denniston Track < 10 cpd NOTE: Forms part of a linked set of MTB trails	Denniston Track – < 10 vpd
Exposure Score:	1/4	1/4	1/4	1/4	1/4	1/4	1/4
Likelihood Comments:	Factors that increase the likelihood include: • Narrow sections of road • Unprotected drains • Unprotected drops • Moderate gradients	Factors that increase the likelihood include: • Narrow sections of road • Small radius curves • Poor visibility on curves • Vehicle sizes (Campervans) • Overheating of brakes	Factors that increase the likelihood include: • Poor line marking • No signage • Driver confusion	Factors that increase the likelihood include: • Unfamiliar drivers • Adverse weather	Factors that increase the likelihood include: • No footpaths	Factors that increase the likelihood include: • Downhill gradient • Road surface	Factors that increase the likelihood include: • Speed • Road surface
	Factors that decrease the likelihood include: • Barriers on some curves • Some edge line markings • Reflector posts	Factors that decrease the likelihood include: • Centre line marking	Factors that decrease the likelihood include: •	Factors that decrease the likelihood include: •	Factors that decrease the likelihood include: • Very low demand	Factors that decrease the likelihood include: • Uphill gradient	Factors that decrease the likelihood include: •
Likelihood Score:	3/4	3/4	2/4	2/4	1/4	3/4	3/4
Severity Comments:	Factors that increase the severity include: • Steep drop-offs • Trees	Factors that increase the severity include: • Downhill speed	Factors that increase the severity include: • Side impact crashes	Factors that increase the severity include: •	Factors that increase the severity include: • Vulnerable road user	Factors that increase the severity include: • Downhill speed	Factors that increase the severity include: • Downhill speed
	Factors that decrease the severity include: • Moderate speeds	Factors that decrease the severity include: • Moderate speeds	Factors that decrease the severity include: • Low Speeds	Factors that decrease the severity include: • Moderate traffic speeds	Factors that decrease the severity include: • Moderate traffic speeds	Factors that decrease the severity include: • Moderate traffic speeds	Factors that decrease the severity include: • Moderate traffic speeds
Severity Score:	3/4	3/4	1/4	1/4	2/4	2/4	2/4
Product **(multiply scores above for crash type)**	**9/64**	**9/64**	**2/64**	**2/64**	**2/64**	**6/64**	**6/64**
						TOTAL	**36/448**

Table A-2: Construction Scenario

	Run-off road	Head-on	Intersection	Other	Pedestrian	Cyclist	Motorcyclists
Exposure Comments:	Denniston Track – <500 vpd 50 heavy vehicles per day	Denniston Track – <500 vpd 50 heavy vehicles per day	Denniston Track – <500 vpd 50 heavy vehicles per day	Denniston Track – <500 vpd ~~Low heavy vehicle volumes~~ 50 heavy vehicles per day	Denniston Track - < 10 ppd	Denniston Track < 10 cpd NOTE: Forms part of a linked set of MTB trails	Denniston Track – < 10 vpd
Exposure Score:	1/4	1/4	1/4	1/4	1/4	1/4	1/4
Likelihood Comments:	Factors that increase the likelihood include: • Narrow sections of road • Unprotected drains • Unprotected drops • Moderate gradients • Heavy vehicles crossing centre line	Factors that increase the likelihood include: • Narrow sections of road • Small radius curves • Poor visibility on curves • Vehicle sizes (Campervans) • Overheating of brakes • Heavy vehicles crossing centre line	Factors that increase the likelihood include: • ~~Poor line marking~~ • ~~No signage~~ • ~~Driver confusion~~ • Heavy vehicles	Factors that increase the likelihood include: • Unfamiliar drivers • Adverse weather • Heavy vehicles crossing centre line	Factors that increase the likelihood include: • No footpaths • Heavy vehicles	Factors that increase the likelihood include: • Downhill gradient • Road surface • Heavy vehicles crossing centre line	Factors that increase the likelihood include: • Speed • Road surface • Heavy vehicles crossing centre line
	Factors that decrease the likelihood include: • Barriers on some curves • Some edge line markings • Reflector posts	Factors that decrease the likelihood include: • Centre line marking	Factors that decrease the likelihood include: • Revised line marking • Signage	Factors that decrease the likelihood include: • TMP	Factors that decrease the likelihood include: • Very low demand	Factors that decrease the likelihood include: • Uphill gradient	Factors that decrease the likelihood include: •
Likelihood Score:	3/4	3/4	1/4	2/4	1/4	3/4	3/4
Severity Comments:	Factors that increase the severity include: • Steep drop-offs • Trees	Factors that increase the severity include: • Downhill speed • Heavy vehicles	Factors that increase the severity include: • Side impact crashes • Heavy vehicles	Factors that increase the severity include: • Heavy vehicles •	Factors that increase the severity include: • Vulnerable road user • Heavy vehicles	Factors that increase the severity include: • Downhill speed • Heavy vehicles	Factors that increase the severity include: • Downhill speed • Heavy vehicles
	Factors that decrease the severity include: • Moderate speeds • Low truck speeds	Factors that decrease the severity include: • Moderate speeds • Low truck speeds	Factors that decrease the severity include: • Low Speeds • Low truck speeds	Factors that decrease the severity include: • Moderate traffic speeds • Low truck speeds	Factors that decrease the severity include: • Moderate traffic speeds • Low truck speeds	Factors that decrease the severity include: • Moderate traffic speeds • Low truck speeds	Factors that decrease the severity include: • Moderate traffic speeds • Low truck speeds
Severity Score:	3/4	3/4	2/4	2/4	2/4	3/4	3/4
Product (multiply scores above for crash type)	**9/64**	**9/64**	**2/64**	**4/64**	**2/64**	**9/64**	**9/64**
						TOTAL	**44/448**

Appendix B Fuel Tanker Vehicle Tracking Diagrams

Appendix C Truck and Trailer Vehicle Tracking

Appendix D Heavy Vehicle Tracking Diagrams

Appendix E Transporter Vehicle Tracking

Figure F-2: Denniston Track (0.6 – 1.5 km)

Figure F-3: Denniston Track (1.5 – 2.0 km)

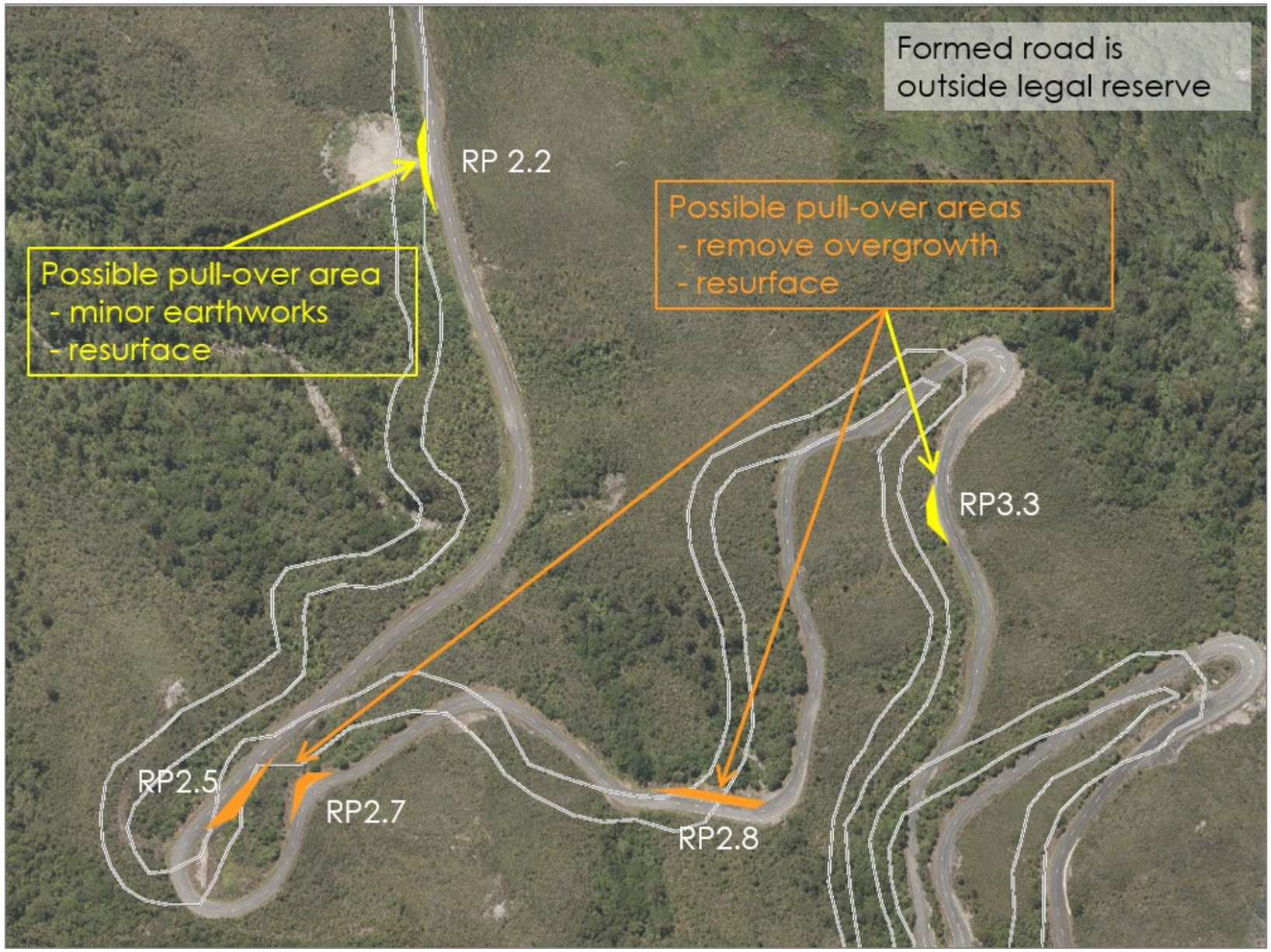

Figure F-4: Denniston Track (2.0 – 4.0 km)

Figure F-5: Denniston Track (4.0 – 4.7 km)

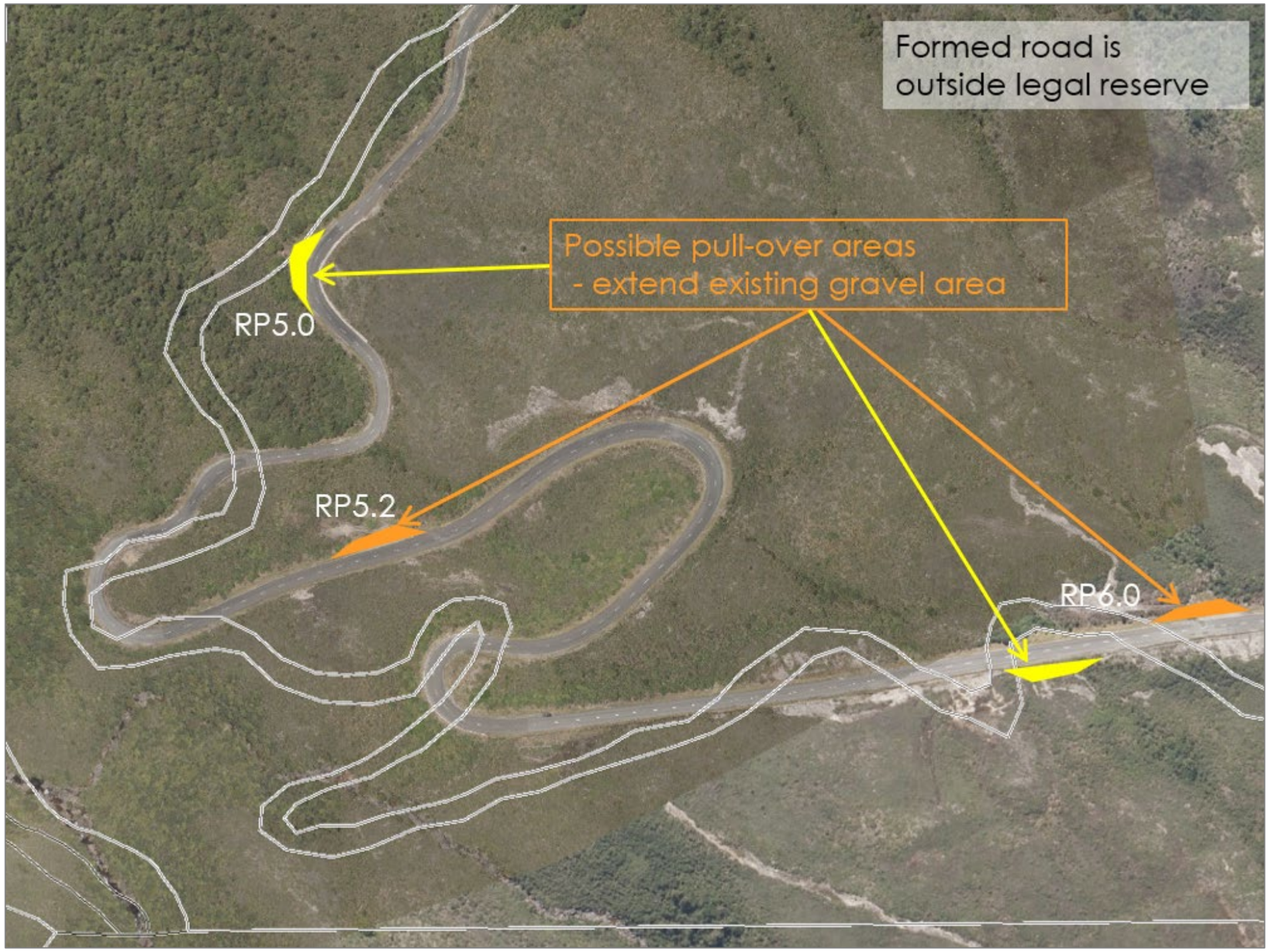

Figure F-6: Denniston Track (4.7 – 6.0 km)

Figure F-7: Denniston Track (6.0 – 6.6 km)

Figure F-8: Denniston Track (6.6 – 7.2 km)

Figure F-11: Denniston Road / Burnetts Face Road / Boswell Street intersection improvements

Stantec

Stantec is a global leader in sustainable engineering, architecture, and environmental consulting. The diverse perspectives of our partners and interested parties drive us to think beyond what's previously been done on critical issues like climate change, digital transformation, and future-proofing our cities and infrastructure. We innovate at the intersection of community, creativity, and client relationships to advance communities everywhere, so that together we can redefine what's possible.

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