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The Bulletin Kaikoura earthquake update

Nine months ago the Kaikoura coastline, the communities it supports and the road and rail transportation corridor that runs its length was changed forever when a 7.8 magnitude earthquake hit in the early morning.

The earthquake disrupted the lives of those who live along the highway and who rely on the road and rail networks to access their homes, farms and businesses and the movement of goods to market.

The North Canterbury Transport Infrastructure Recovery (NCTIR) alliance was set up by the Government under the Hurunui/Kaikoura Earthquakes Recovery Act 2016 to repair and get the road and rail networks reopened by the end of 2017 and repair the Kaikoura marina.

Since then the NCTIR team* has worked tirelessly to clear massive slips, reconnect the Main North Line (MNL), repair and rebuild bridges, culverts, retaining walls and realign sections of State Highway 1 away from hillsides and deliver a \$60m improvement programme on the alternate Picton to Christchurch route.

The team of up to 1500 workers from all over New Zealand and overseas was assigned ambitious goals to reopen the MNL as soon as possible and SH1 before Christmas 2017. We are pleased to report that we are very close to achieving one of those goals and are well on the way to re-opening the entire length of SH1 before Christmas this year.

ROAD



Significant progress has been made on repairing earthquake damage that affected 194 kilometres of State Highway 1 between Leithfield and Blenheim. During the first few months the focus has been on recovery and clearing slips both north and south of Kaikoura.

North of Kaikoura the major challenge has been clearing nine significant slips between Mangamaunu and Wainui. 85% of this slip material has now been cleared. At the same time engineers have worked behind the scenes on rail, road, bridge culvert and seawall designs which are being built as soon as material is cleared.

Geotechnical experts have designed and installed rockfall protection measures and things are looking good for a reopening the entire length of SH1 by Christmas 2017.

RAIL



Repairs on the Main North Line (MNL) have progressed quickly and rail was reconnected on 8 August.

Once complete the repair job will represent one of rail's biggest rebuilds in New Zealand since World War II, according to KiwiRail.

The MNL was buried under more than 100 slips and landslides and repairs are happening at more than 750 sites including 60 damaged bridges.

Getting the line open, even on a restricted basis, will ease pressure on the alternate Picton to Christchurch route. The opening is also expected to take up to 2000 trucks per month off the roads and help with the reinstatement of SH1 by moving materials to worksites along the route.

MARINA



The Kaikoura marina was badly damaged during the earthquake when the seabed rose by up to two metres. It is on track to reopen in November 2017. The sea channel and harbour floor have been dredged back to their original depth and new retaining walls are being built along the promenade and rock groyne walls. A new Dolphin Encounter jetty and tender (small boats that ferry cruise passengers to shore) jetty are also being built.

The harbour has been filled with material to create a 'hard stand' for machinery to work from. Once work is completed, this working platform will be removed and the area restored to a berthing area for four large boats.

*NCTIR is an alliance partnership between the NZ Transport Agency, KiwiRail, Fulton Hogan, Downer, HEB Construction and Higgins

Celebrating progress towards moving mountains

by NZTA Recovery Manager Steve Mutton

The reconnecting of the road and rail network along the East Coast of the South Island during the first half of August was a significant milestone in re-opening State Highway 1.

While there is still a lot to do to get SH 1 reopened by the end of this year, we're working hard, and around the clock in the areas where we're able to do so, to ensure we meet the December 2017 target.

We have already made great progress.

But it's hard to understand the scale of the work being undertaken by our teams and the daily challenges they face, until you're standing on the ground looking up at a slip. At Site 1 just north of Kaikoura, for example, the two slips were 104 and 153 metres high and it took five months for us to remove more than 10,000 truckloads of material. And that is just one of the slips at nine main sites north of Kaikoura.

We are literally moving mountains to get the highway re-opened - it's arduous work in often atrocious conditions. Yet, all our teams continue to pull out the stops to get the job done and we thank them for their tenacity, commitment and goodwill. (Steve Mutton is pictured left)



What an achievement

by KiwiRail Recovery Manager Walter Rushbrook

For the physical works to get to a point where the rail will see revenue trains running again, many people need to be thanked - what an achievement!

Just after the earthquake all we had was an aspirational target to reopen the transport corridor. It has been very satisfying to see that aspiration evolve into detailed plans that have enabled the construction teams up and down the line to deliver the repair works.

Reopening the railway line will help make the rail network whole again, and will enable freight to be moved more effectively between Picton

and Christchurch. This is a great outcome for New Zealand and will also help take traffic pressure off the alternative state highway route. Initially freight trains are only going to run at night time but work trains and track machines will be operating on the line during day time as part of the continuation of permanent repairs of the transport system

On behalf of the team, I would like to acknowledge the enormous support we have had from throughout NZ. It has been a real boost as we work as hard and fast as possible to reopen the transport corridor. (Walter Rushbrook is pictured above right).

Moving forward

NCTIR PROGRESS MILESTONES	Expected date of completion (as at 30 August 2017)	Aug 2017	Sept 2017	Oct 2017	Nov 2017	Dec 2017	Jan 2018
MNL Track completion	August 2017	Completed					
Construction Access Open (Ohau Point)	August 2017	Completed					
Earthworks/ slip clearance	September 2017		2wks				
Kaikoura Marina opens	November 2017				10wks		
Retaining walls (Hundalees)	November 2017				12wks		
Rock fall mitigation (North)	December 2017					13wks	
Rock fall mitigation (South)	December 2017					15wks	
Road (Coastal realignment)	November 2017					15wks	

Milestones

Railway reconnection achieved

Tuesday 8 August 2017 will go down in New Zealand history as the day the Main North Line between Picton and Christchurch was reconnected, nine months after the Kaikoura earthquake.

The seaside ceremony started with a karakia from Te Runanga O Kaikoura followed by the actual welding of the final section – a precise and timed operation watched by those gathered to witness the event from an elevated pile of ballast.

For KiwiRail ganger (foreman) Paul Jones, it was an emotional day, 'It actually brought tears to my eyes,' says Paul whose grandfather and uncle also worked on the railway.

Achieving this milestone means freight services can resume once all the commissioning process is complete. The initial freight opening will be a restricted one, with low-speed, low-frequency services. There is still a lot of work to do to return the line to its pre-quake state and freight services will initially run only at night so that work on the rail and road networks can continue during the day.

The Picton to Christchurch section of the Main North Line carries about one million tonnes of freight every year, so this achievement means the pressure will be taken off the alternative Picton to Christchurch route which has been the main route to shift freight since the earthquake.

The completion of the rail also means work to repair and rebuild State Highway 1 north of Kaikoura can now move into another gear as worksites will be less congested and work trains can be used to move equipment and material between sites.



Ohau point access track

A major milestone was reached in August with the final stages of an access track cut around the edge of Ohau Point north of Kaikoura.

This means that for the first time since last November's earthquake, heavy machinery is finally able to travel the length of the coastal corridor.

Using a boulder layer and slip material, crews have carefully built the track, which will now be built up to seven metres above sea level using material from Site 7a and existing beach gravel to fill it.

Rock armour on the outside of the track will protect it from being washed away during high swells. This coastal protection is similar to what was used on the edge of the new road alignment built at Site 29a, south of Kaikoura.

Project Manager David McGoey says the track is being built outside of the rock fall zone, meaning abseilers working at the top of Ohau Point can continue bringing down rocks and installing mesh while vehicles drive past 180 metres below.

'It's an important milestone and a boost for the crews working on this project,' he says.

While crews now have access around all 10 landslides, this will still be restricted to construction workers until the end of the year.

'A 50-tonne crane, excavators and loaders will be working along this track, preparing the foundation, pouring concrete and installing seawall blocks for a new road to be built 7.5 m high around the base of Ohau Point,' says David.



Our progress story so far



we have cleared many of the **85** landslides along SH1 including most of the major ones

we are working on **1500** damaged sites along SH1

85% of earthworks complete

900 quake damaged rail sites

50,000m³ of ballast produced to repair rail corridor

20 rail tunnels damaged

300m with major damage

190 km rail affected

we are making good progress on the **2.5 km** of sea walls being **built** along SH1

35% of work to build a seawall is in preparing the foundations

7000+ blocks needed to build the seawalls north of Kaikoura

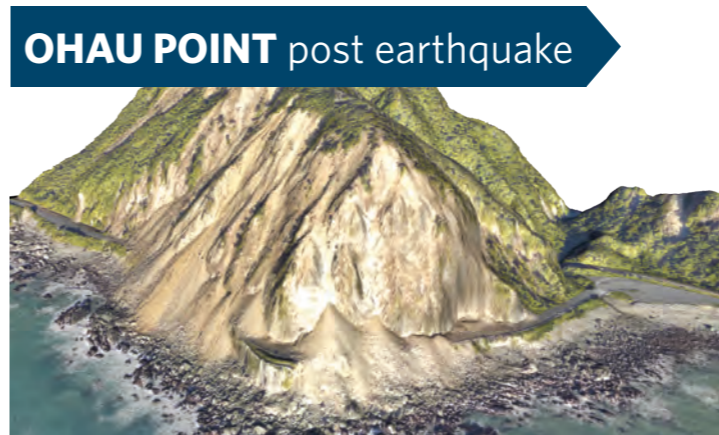
Each block weighs **5 tonne**

194 km of road affected between Leithfield and Blenheim

3144 total number of all seals moved out of construction sites between March & July (includes the same seal moved more than once)

200 seedlings propagated from the seeds of 6 rare Ohau Point Rock Daisy plants

Before and after



Alternate route improvements to ramp up in summer



1000
heavy vehicles
through Murchison
each day
350
Pre earthquake

4000
vehicles IN TOTAL
through Murchison
each day
2000
Pre earthquake

\$60mil
to improve
route

154km
of road to be
upgraded
(58km completed)

71 km
of road to be
widened
(46km completed)

After the November earthquake closed State Highway 1 (SH1) and the Main North Rail Line between Picton and Christchurch, the alternate route via the alpine Lewis Pass became the only major economic lifeline for the South Island.

Drivers – including freight drivers who delivered goods up and down SH1 on a tight daily schedule, along with growing numbers of tourists – were having to contend with a narrow, winding and challenging route which took more skills and longer to drive.

More significantly, local communities had up to four times the amount of traffic on the highway network which was not designed for this volume.

Funding improvements

In recognition of the impact on drivers, communities, and the road itself, a massive \$60M Government-funded safety and strengthening improvement programme began last summer. Regular drivers will have seen the Bailey bridges, road widening, pull-over areas, slow vehicle bays, improved road markings, signage and guardrails, among others being constructed – often seven days a week, day and night.

Winter maintenance and keeping the route open

With cold, wet, snowy and icy winter conditions unsuitable for some road construction work, the winter focus has been on maintenance and keeping the road open. While some improvements are still happening during windows of good weather, overall there are fewer work sites.

Summer schedule means massive ramp up

From September when conditions get warmer and drier, an army of cones and workers will be out in force to carry on improvements and post-winter repairs.

The NZ Transport Agency knows that making this a safer and better route is good news for everyone. Short term it does mean a long line of disruptive work sites and delays to navigate daily. This is frustrating for drivers whose patience is very much appreciated.

Help keep everyone safe

Keeping everyone safe – from drivers to road crew working perilously close to moving traffic – is the number one priority and also everyone's responsibility. Before travelling, plan ahead to allow for delays, take plenty of breaks and help keep everyone safe by driving patiently and courteously.

The crews thank everyone impacted by their work for their support, including the local communities for their warm welcome while they get this important work done.



PHOTO: Adventure South

Creating great journeys

Planned infrastructure improvements on SH1 between Clarence and Oaro, to be delivered through a \$231 million Government boost, will enhance the earthquake reinstatement work.

While the Government's priority is to restore the pre-earthquake transport links and ensure they're resilient, the additional investment will help to improve safety, journey reliability, access and public amenities.

Infrastructure improvements will include wider shoulders, additional safety barriers, more passing opportunities, and improved access and stopping areas. Visitor facilities will be upgraded with improved access and parking and new amenity and toilet facilities at key destinations along the route.

A new shared path between Okiwi Bay and Mangamaunu will provide a safer and more enjoyable way for people to experience this section of the iconic coastline on foot or by bike.

'These improvements will provide for great journeys and enhance visitor experiences to support increased tourism and economic growth in the region,' Transport Minister Simon Bridges says.

NCTIR will deliver the improvements alongside the earthquake reinstatement work, meaning minimal disruption for those that live, work or travel in the region.

Expect trains at any time, from either direction

Trains are now operating on the Main North Line between Blenheim and Christchurch.

This is a timely safety reminder to everyone living, working or visiting the East Coast that trains are operating so you need be careful around the tracks both day and night. You should expect trains at any time, from either direction.



Key safety messages for pedestrians

- Every time you're near railway tracks, be alert.
- Only cross at formed pedestrian crossings or an overpass or underpass.
- Remove your headphones, stop and always look both ways for trains before crossing the tracks.
- Only cross if you are sure there are no trains in sight.
- Obey the warning signs at the crossing – if lights are flashing or bells are ringing it means a train is approaching.

Key safety messages for motorists

- Take extreme care when driving over a railway level crossing.
- Obey the warning signs and look carefully in both directions for trains.
- Listen, be aware and pay careful attention to your surroundings.
- Always ensure there is space on the other side of the crossing for your vehicle.

Life between the landslides

Sharing the road with heavy construction machinery is daily life for a handful of residents living south of the checkpoint at the Clarence Bridge.

Gig and his partner Marg have lived in their stone clad home since the 1970s and an earthquake wasn't about to send them packing.



'We can't think of a nicer place to live in New Zealand, why would we want to move?' Gig says.

With five sheep, three horses, a dog and native birds in the trees, the couple lived a picturesque lifestyle until last November's earthquake hit.

It 'hammered' their home, nothing was left standing, the fridge and stove both toppled in the shake that was "so violent we couldn't move."

But there are pluses for these lifestylers. They say the earthquake created a new surf break in just two minutes. They can't reach the beaches south of Kaikoura but now they have a beach all to themselves.

When they bought the property in the 1970s, stone mason Gig carted around 7500 stones from the Clarence River to clad the front of the house. Now their home needs repairs and every single stone will need to be removed.

Its yellow stickered so they can't stay there at night so they have had to fix up the shed at the back of the property which they are currently living in.

The couple say the communication with the earthquake repair teams has been great and they are enjoying seeing the progress as construction machinery continues to bite away at the landslides north of their home.

Local involvement

Locals have been involved in the Kaikoura earthquake recovery since day one.

North of the township, Kevin Rush and his team of eight employees have been busy shifting mountains as part of the wider earthworks team.



With two excavators, two bulldozers and a fleet of trucks, Kevin's second generation business is a big part of the northern clearance operation.

The family business originally started in the mid 1950s and Kevin has been at the forefront of it since 1996 carrying out contracts on behalf of local farmers and KiwiRail.

The prospect of working on landslides up to 400m high doesn't phase him in the least. 'I've been doing this all my life, this time around the slips are just much larger,' Kevin says.

With his 40 years of industry experience, Kevin was only too happy to lend a hand when the earthquake struck and has taken on five extra staff members.

'It's a great community project and I'm enjoying helping out with my local knowledge,' Kevin says.

Kevin always knew the slips were massive but says photos don't do the job justice.

'Excavators look like matchboxes on these slips and you need to remember they are up to 50 tonnes in size, that's how massive these monster landslides are.'

We care for our people, their families and the communities we work in



Keeping in touch

Thank you for your ongoing support and patience as we continue our essential work to reconnect communities affected by the November 2016 earthquake. This work is by nature a dirty, dusty and sometimes noisy operation. Please contact us if our work is causing problems for you. We remain committed to resolving issues wherever we can.

- **Visit our website:** www.nzta.govt.nz/kaikoura-earthquake-response/
- **Call our freephone:** 0800 NCTIR EQ (0800 628 4737)
- **Email us if you have a question:** info@nctir.com
- **Attend a community meeting** - keep an eye on your local newspapers for details.
- **Follow us on Facebook**, see: NZ Transport Agency – South Island www.facebook.com/nztasouthisland/ and KiwiRail www.facebook.com/kiwirailNewZealand/
- **For travel information about road conditions, see:** www.nzta.govt.nz/traffic/regions/11



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