



# The Bulletin Kaikoura earthquake update

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## OUR 2018 AGENDA

We are back working on the road and railway for 2018 to complete the reconstruction of these corridors and delivering a range of improvements along the corridor.

Last year we opened the harbour, the highway and the rail line to a limited service. This year our work will be quite different with our crews sharing the highway with those making their journey between Picton and Christchurch.

'Our priority is to continue to deliver high-quality work, while keeping our crews and travellers safe,' says NCTIR Project Director David Loe.

'We are working in a dynamic environment which can be unpredictable. Some areas have proven tricky, such as site 9 at Waipapa Bay, north of Kaikoura, which has an unsettled slip,' says David. 'In the year ahead we will be concentrating on delivering the solutions we have come up with for these areas, while also continuing to monitor and respond to them as required.'

Reconstruction work along the corridor will focus on completing rockfall protection on the coastal cliffs using a variety of methods, including mesh and fences, installing more-permanent protective walls and further developing rockfall catchment areas.

'On the coastal side of State Highway 1, we will be finishing the seawalls and bringing the road up to full height.'

On the rail network, bridges such as the one at Tirohanga, north of Kaikoura, will be completed. Once this happens, crews will be lifting the rail line off temporary structures and placing it onto repaired or new permanent structures.

State Highway 1 improvements are also on the agenda. Improved amenity areas such as toilets, stopping bays, information boards and the cycleway are being investigated (and this work will extend beyond 2018).

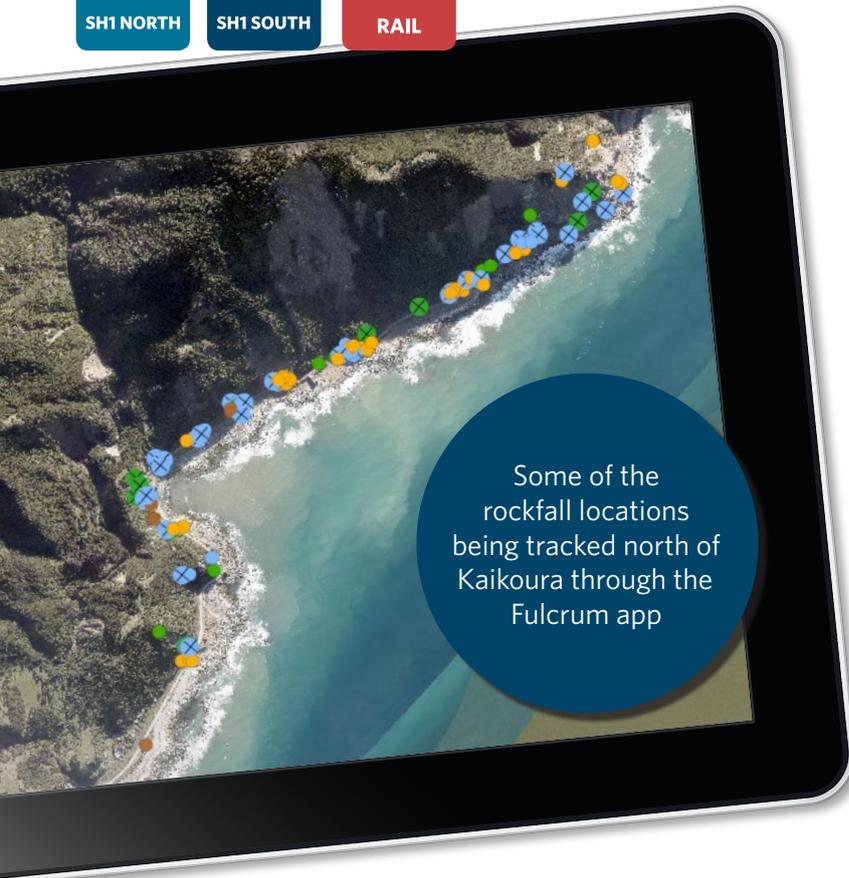
'This year's work programme will continue to meet safety, environmental, cultural and planning requirements, and we expect weather and sea conditions to continue to present challenges.'

'There's a lot of work ahead of us, and we're committed to communicating about what is happening and working with affected communities.'





## TRACKING ROCKFALL



On-the-go data collected about rockfalls is providing a better understanding of how the slopes along State Highway 1 north and south of Kaikoura are performing. The road and rail infrastructure north and south of Kaikoura is vulnerable to rockfall from the 40-plus slips along the road.

To better understand the slips and rockfalls, our geotech teams have been feeding data about rockfall activity into an app by Fulcrum, which records the location and key information.

This includes the type of event (e.g. rockfall, landslide, etc), its cause, the amount of material involved, the size of fallen rocks, and whether the fallen material was caught by protective structures (if present) or if it landed on the road and/or rail corridor. The app automatically records the GPS location so the geotech crew can see where things are happening. More than 450 events have been recorded since we started using the app in late July.

'The earthquake has changed the hillsides, which means we are essentially dealing with new slopes,' says Geological Engineer Rori Green. 'There is a lot we don't know about them and how they will act in different circumstances'.

'By tracking the size, location, cause and effect of rockfall, we can better understand the behaviour of the slopes and how well protection measures are working.'

Rockfall causes can include rainfall, wind, earthquakes and even goats! Heavy rain is a particular trigger point for some of the slips, which is why the NZ Transport Agency and Kiwirail may decide to close the road and rail during some weather events.

The data collected helped inform our decision-making about opening the road last December. It will also help mitigate risks along the transport corridor. As more data is collected, the understanding of earthquake-affected slopes improves, allowing us to plan accordingly.

'This contributes to our efforts to protect the road and rail infrastructure, as well as the people working and travelling along these corridors,' says Rori.



Rockfall on the road after caused by rainfall last year



## SHARING THE ROAD

You wouldn't generally pass dozens of work sites on your morning commute, travellers are now sharing the road with NCTIR's crews as work along SH1 ramps up once more.

After a summer holiday break, NCTIR's crews are refreshed, recharged and ready to tackle months of work ahead to complete construction while also starting work on the new \$231m improvements package later this year.

Four retired American biologists who drove through a series of active worksites on their way into Kaikoura stopped for a bite at Nin's Bin. Glen Collier was impressed by how crews kept road users safe.

'The stop/go points were well marked and visible, everyone we passed waved and was very friendly. We felt very safe and other drivers were also cautious - there were no speed demons out on the road today,' says Glen.

Nancy Armstrong, also part of the visiting group, was impressed by the condition of the road.

'Due to the speed restrictions, this road was safer to drive on the left than other highways in New Zealand,' says Nancy.

Safety of people is NCTIR's number one priority. Health, Safety and Quality Manager, Stephen Bell says a strict safety plan had to be implemented before State Highway 1 could reopen.

'We needed to assess the entire corridor and make sure it was ready for traffic. We have reduced the speed across the route and have fenced off our worksites to keep them separate from the road,' Stephen says.

Crews working south of Kaikoura are used to traffic running through their sites, however this will be the first time workers in the north have had to share the road.

'More than a thousand NCTIR workers have taken part in a series of workshops during the last fortnight to make sure they're ready for traffic to start running through their sites.'



Retired American biologists and friends are all smiles after enjoying the delights of Nins Bin



Workers and road users share the coastal corridor

# ROAD REBUILDING AT OHAU POINT

## WHAT HAPPENED?

During the November 2016 earthquake, the largest and most complex slip occurred at Ohau Point. It took 8000 truckloads to remove 160,000m<sup>3</sup> of slip material before construction crews could even access the site to start rebuilding the highway. And although design work for the road rebuild began soon after the 2016 November earthquake, plans could not be finalised until the slip was cleared in winter last year and the site could be fully investigated.

## WHY DID WE MOVE THE ROAD CLOSER TO THE COASTLINE?

Rebuild options such as a tunnel, reinstating the former road, and a bridge, were investigated. The earthquake pushed the land up by up to seven metres, so there was more terrain to use for the rebuild. Moving the road and protecting it with a seawall was chosen as the most suitable solution because it included protection from further rockfall and could be designed to resist earthquakes and coastal weather. The seawall option was also flexible - the highway being able to be opened while construction was completed.



## WHAT THE FINISHED ROAD WILL LOOK LIKE

The road, now open to the public, is still 'under construction'. Once completed it will be, on average, five metres higher than it currently is. It will be wider than the old road, making it safer and more enjoyable to drive.





### OLD ROAD AND THE SLIP

Above the current road, the barrier of the old road is twisted and mangled by the fallen material, which came down in the earthquake and subsequent weather events. The old road is now being used as a protective catchment area for future falling rocks, using new rock protection structures.

### INNOVATION ON THE ROAD

With cliffs on one side, the sea on the other and a road susceptible to coastal weather and earthquakes, our design team made innovative use of state-of-the-art construction materials to ensure robust construction. This tested technology means the road has been designed to perform better during seismic and storm events and would be quicker to repair and reopen.



## EXPECT TRAINS AT ANYTIME

For the first time in more than a year trains and vehicles are sharing the coastal corridor.



## KAIKOURA CONTAINER MALL

Amazing spaces keep popping up in Kaikoura. Visit our transport recovery hub in Paper Plus at the new communal green and container mall area in the heart of Kaikoura to discover more about the NCTIR project - rebuilding the Kaikoura's harbour, reconnecting the Main North railway and reopening State Highway 1. If you are in Kaikoura, pop in for a visit, enjoy the outdoor green space, and have a go at the supersized version of Connect Four!





## HI HIGHWAY HELPERS

Donning a high-viz jacket, NCTIR's Highway Helpers have been travelling State Highway 1 since the reopening.

The face of the NCTIR rebuild, Highway Helpers have been providing support to road users between Picton to Christchurch. The eight-person strong team has travelled thousands of kilometres over the last month and will continue to be helping out on the roads until the end of the January.

For 22-year-old Liz O'Connor, the job has been fun, varied and extremely rewarding. The bubbly Kaikoura local is spending her summer holiday sharing advice with road users.

'It's great fun; it's awesome to be able to help motels, businesses and travellers, making sure they have up-to-date information about the road and leaving them with smiles on their faces.'

Dutch tourists Dylan and Aienke Otto spent three days holidaying in Kaikoura, enjoying the coastal life and sampling some of the seafood. Dylan says the information from the Highway Helpers was much appreciated.

'It was great to help us plan our journey, it's always good to have the most up-to-date news about the road.'



Highway Helper Liz O'Connor shares State Highway 1 information with tourists Dylan and Aienke Otto in Kaikoura

### HIGHWAY HELPER HOT TIPS:

**Q:** How can I find out if State Highway 1 north and south of Kaikoura is open today?

**A:** For real time travel info visit [www.nzta.govt.nz/p2c](http://www.nzta.govt.nz/p2c) or freephone **0800 4 HIGHWAYS**.

**Q:** How long will it take me to get from Picton to Christchurch if SH1 is open?

**A:** Plan for the journey to take a minimum of five and a half hours.

**Q:** Can I camp within the closure areas north and south of Kaikoura?

**A:** Clarence to Mangamaunu and Peketa to Goose Bay are two sections of SH1, which were badly affected by the earthquake and it is unsafe to camp in these areas overnight until all reinstatement work is complete.

## HOW DO I STAY UP-TO-DATE WITH INFORMATION THAT MAY AFFECT MY JOURNEY ON SH1?\*

The NZ Transport Agency is the best place to get the latest details 24/7. Get information on delays, travel times and road closures from the following ways:

 Sign up to automatically get emails about major events (or issues that require caution) which could affect your journey at [www.onthemove.govt.nz](http://www.onthemove.govt.nz)

 Visit [www.nzta.govt.nz/p2c](http://www.nzta.govt.nz/p2c)

 Phone **0800 4 HIGHWAYS**  
(0800 44 44 49)

\* The Transport Agency recommends you check your journey two hours before you travel as things can change quickly.



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