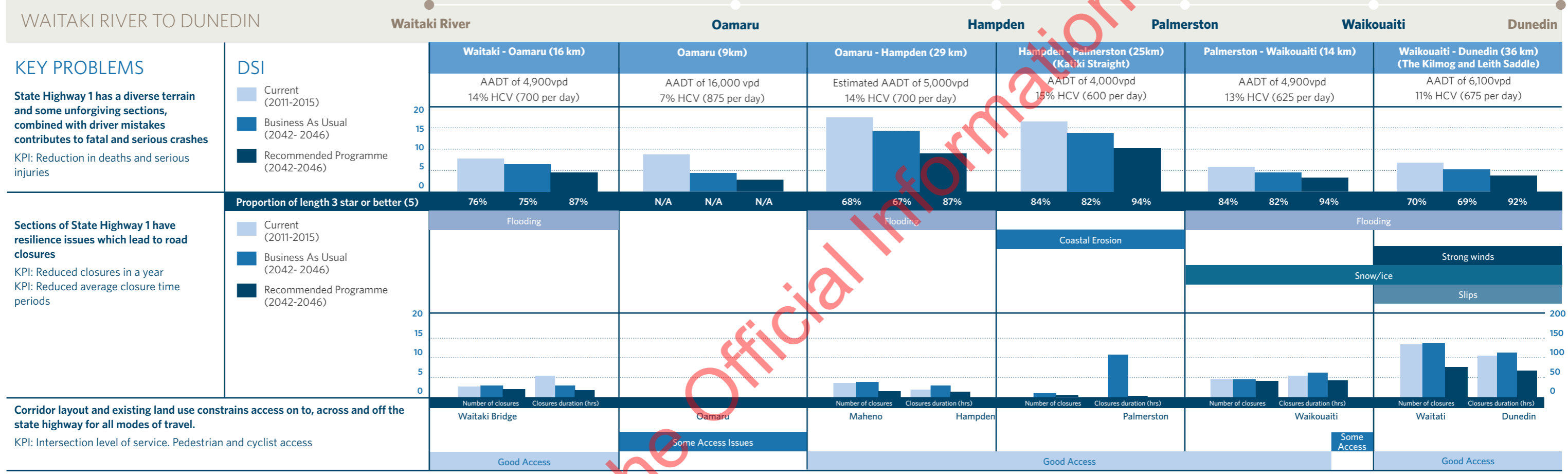


CHRISTCHURCH TO DUNEDIN: NORTH OTAGO RECOMMENDED PROGRAMME



RECOMMENDED PROGRAMME

ACTIVITY	Waitaki - Oamaru	Oamaru	Oamaru - Hampden	Hampden - Palmerston	Palmerston - Waikouaiti	Waikouaiti - Dunedin
Short term 2017-2026	Stock underpasses and RIAWs at SH83 intersection	North Oamaru corridor improvements	Level rail crossing improvements at Maheno	Passing lane north of Palmerston, RIAWs and vertical realignment at Moeraki Boulders. Coastal erosion protection at Katiki Straight	Corridor safety improvements	Delineation improvements, surfacing enhancements, median and delineation improvements, snow/ice activated warning signs/pavement markers Waikouaiti flooding improvements and safer corridors treatment
Medium term 2027-2036	Hilderthorpe Straight flood improvements and corridor safety improvements	Oamaru safety and access improvements Deborah Underpass improvements	Centrelines wire-rope barriers (Herbert - Hampden) and corridor safety improvements Vertical and horizontal realignment south of Herbert	Corridor safety improvements	Out-of-context curve easing	Centrelines barriers through 2+2 passing lanes Out-of-context curve easing
Long term 2037-2046						
Capital Cost (\$M)	\$15M	\$25-30M	\$25-30M	\$50-60M	\$12M	\$35-40M
Additional Operations and Maintenance Cost (\$k)	\$200k	\$400k	\$500k	\$300k	\$200k	\$1200k
BCR	<1	<1	<1	<1	<1	<1
Corridor Wide Activities	Short term - Traveller information improvements, Incident response planning and detour planning, variable messaging signs, telco dead-zone elimination, behaviour improvements and pedestrian crossing improvements in small towns. Medium to long term - roadside hazard removal (including roadside power poles)					

PBC Outcomes

29-37
DSIs saved (10 yr period)

91%
Three star KiwiRAP rating or better

3-4
Hours reduced average

Programme investment profile
H/H/0.3-0.8

SH1 CHRISTCHURCH - DUNEDIN NORTH OTAGO (WAITAKI - NORTH DUNEDIN)

State Highway 1 (SH1) is of national significance for moving people and goods critical to the country, region and local communities. It is the primary roadbased transport route in the South Island and is a national route in the one network road classification (ONRC). The role of this journey connects the South Island's two largest population centres Christchurch and Dunedin for the purposes of freight, tourism, inter-regional and local travel.

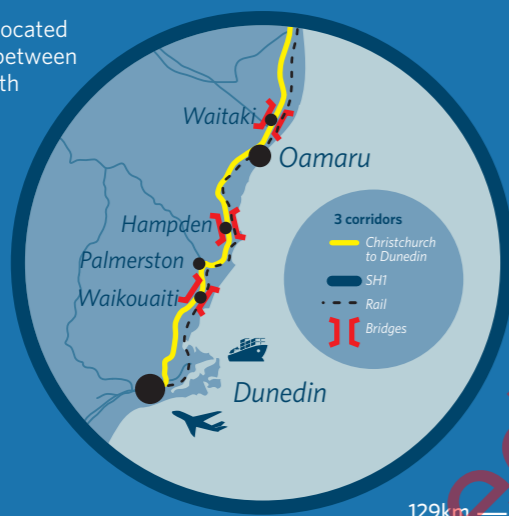
The North Otago segment of the corridor is from the Waitaki River and the Pine Hill intersection. The southern sections of the segment include the Leith Saddle and the Kilmog. This section is challenging and unforgiving with out-of-context curves throughout this segment of the corridor. The segment of the highway passes through, over and beside several natural environments such as low-lying flood plains, coastal marine areas and elevated snow-prone areas that can experience closures during certain weather events. The main south rail line runs adjacent to the state highway for much of the route, and the close proximity can present safety issues for vehicle access to the state highway.

The town of Oamaru is located approximately halfway between Timaru and Dunedin, with smaller settlements generally evenly interspersed along the corridor. The predominant land-use along the route is rural farm land, with

intensive dairy and agriculture production facilitated through expanding irrigation schemes within Waitaki District. The town is self sufficient with little interaction with the north or south.

The key issues for the North Otago segment are road user safety, resilience from low impact high probability (LIHP) events such as snow/ice and flooding and access on to, across and off the state highway for all modes of travel in Oamaru. The North Otago segment has an average crash rate of 0.087 fatal and serious injury crashes per kilometre each year. This compares to an average crash rate of rate of 0.065 on state highways nationally, and 0.049 on state highways in the Otago region. The crash risk along this segment is unacceptable considering the comparatively lower traffic volumes. There is a significant resilience issue of possible failure and total network loss of the state highway corridor along the Katiki Straight.

The recommended programme for the North Otago segment aims to address road user safety, provide a consistent corridor commensurate with the route classification and volume, and ease of access to the state highway in Oamaru.



PROGRAMME MULTI-CRITERIA ASSESSMENT AT 2046

		Programme 1 Business as Usual	Programme 2 Target Safety and some Access Improvements	Programme 3 Targeted Safety with Resilience for Low Impact High Probability events	Programme 4 Corridor Safety with Resilience from Low Impact High Probability Events	Programme 5 Corridor Safety, Resilience, Access and Active Mode Connectivity	Programme 6 Highly Safe, Accessible, Connected and Resilient Coastal Corridor at Katiki Straight	Programme 7 Highly Safe, Accessible, Connected and Resilient Inland Realignment at Katiki Straight
Investment Objectives	Reduction in deaths and serious injuries Expected deaths and serious injuries in 2042-2046	20% increase on 2011-2015 55-60 DSI	50-55 DSI +	50-55 DSI +	15-25% reduction on BAU 45-50 DSI ++	15-25% reduction on BAU 45-50 DSI ++	25-35% reduction on BAU 40-45 DSI ++	35-45 DSI ++
KPI Outcomes	Road safety risk assessment rating (KiwirAP) (Proportion of length 3 star or better)	73%	88%-92% 0	80%-85% +	87%-90% ++	87%-90% ++	91% ++	95%+ +++
	Average closure duration	11 hrs -	11 hrs -	8-10 hours +	6-7 hours ++	6 - 7 hours ++	6 - 7 hours ++	6 - 7 hours ++
	Number of road closures (per 5 year period)	29 events -	29 events -	20-25 events 0	17-20 events +	17 events ++	17 events ++	17 events ++
	Intersection level of service	-	-	+	+	++	++	+
	Pedestrian and cyclist access	0	+	+	+	++	+++	+++
Other factors	Effectiveness	--	-	+	++	++	++	+++
	Risk	--	-	-	-	--	--	---
	Public & Stakeholders	--	0	0	+	-	--	--
	Inter/ dependencies	++	++	++	+	+	0	-
	Feasibility	++	+++	+	+	-	--	--
	Affordability	+++	++	+	+	++	--	---
	Costs	\$10 - \$25 M	\$30 - \$60 M	\$40 - \$70 M	\$50 - \$130 M	\$80 - \$170 M	\$140 - \$190 M	\$150 - \$325 M
	Benefit Cost Ratio	Low / Medium	Medium	Medium	Low	Low	Low	Low
	Programme Consideration	Short Listed	Not Short Listed	Not Short Listed	Not Short Listed	Short Listed	Recommended programme	Not Short Listed

The Recommended Programme is Programme Option 6 – Significant safety investment in the short to medium term and resilience works in the medium to long term. The programme proposes safety improvements corridor wide and isolated treatments in North Oamaru, Deborah Underpass, Maheno level rail crossing, Moeraki and Leith Saddle. The main resilience interventions are coastal erosion protection at Katiki Straight, flooding improvements at Hilderthorpe, Waikouaiti and Waitati, and preventative maintenance over the Kilmog.

TRIGGER POINTS

Trigger, Risk and/or Uncertainty	Time	Impact level	Impact on programme	Comments
Land Acquisition: Engagement will need to occur with the land holders for localised re-alignments of SH1	Ongoing	Medium	Sections of land will be required for passing lanes, curve easing and shoulder widening throughout the corridor	Only small sections could have difficulties acquiring the land
Consenting for re-alignments: There will be a requirement for consenting for sections of the SH1 that are proposed to be realigned or widened	Ongoing	High	Consenting for the programme is not expected to impact programme delivery if successful but will impact the type of engineering and environmental design and implementation	Geographical constraints may influence design
Full or partial Failure of SH1: There is a considerable risk of a long term closure due to coastal erosion at Katiki Straight	Ongoing	High	This would result in full or partial closure of the highway and major impact on the local communities through severance	Limited sections of the State Highway south of the Waitaki River have a suitable detour route
Sea level rise: there is a risk that the rate of flooding occurrences and duration increases due to sea level rise	Ongoing	Medium	The impact will be on the timing of the flood protection measures	Level of investment may change if the rate of sea level rise is different to predicted

STAKEHOLDERS INVOLVED IN THE PBC

- NZ Transport Agency
- Otago Regional Council
- NZ Trucking Association
- NZ Fire Service
- Dunedin City Council
- Waitaki District Council
- Tourism Waitaki

IMPLEMENTATION PARTNERS

This section is to be completed / confirmed.
Funding is expected to be primarily NZTA.
Some DCC funding

FUNDING SPLIT

