2 The current situation

2.1 Characteristics of our economy and transport network

The base of the economy in Otago and Southland

In 2015/6, Otago accounted for 4.3 per cent of national GDP, and Southland 2.0 per cent. The economy of both our regions relies largely on agriculture and other primary industry, and on downstream manufacturing industries. These industries are heavily dependent on land transport infrastructure for their continued economic growth.

Both Otago and Southland also have a strong tourism industry, with the coastal, lake and mountain areas and scenery being major attractions. Tourism is one of the three fastest growing sectors of the combined regions' economies; tourism growth - particularly from international visitors accessing southern New Zealand through Queenstown – is projected to continue to increase. The tourism sector depends on both the roading network and air services, as well on as the cruise ship visits to Milford Sound, Bluff and Dunedin.

The economic base of Southland region is relatively narrow, while Otago's is somewhat broader. Southland's economy relies heavily on a small number of products such as farming and the aluminum smelter at Tiwai Point near Bluff. The main urban area of Southland, Invercargill, primarily services the farming community, and also houses the Southern Institute of Technology. Rural activities still provide the main driver for Southland's economy.

Dunedin is the largest city in the Otago Southland area, and the sixth largest city in New Zealand. Education and health care are the focus of its economy, with just over a quarter (26.4 per cent) of all employment being in one of those two industries². This reflects the importance of Dunedin's education assets; the University of Otago alone has been estimated to contribute to around 15 per cent of the city's GDP³.

After education, business services and health services Dunedin's largest employment sectors are accommodation, cafés and restaurants, retail, community services, construction, food retailing and manufacturing. Manufacturing employment has been declining in Dunedin, although this is being offset with gains in the high-tech and ICT sectors. Major employers are the University of Otago, Otago Polytechnic and the region's base hospital in Dunedin, which includes specialist services.

The Queenstown economy is a challenging one. As a key selling point for NZ's tourist industry, the district has a large impact on the national tourism economy. Distance from markets for goods and services, coupled with the small local market, mean that local businesses struggle to achieve the economies of scale in the same industries in larger markets. This constrains productivity and thus profitability and incomes⁴. Moreover, high housing prices and high building costs challenge affordability.

Summary of the transport network

Otago and Southland are the southernmost regions in New Zealand, together comprising nearly half of the South Island's land area and are similar in size. They are among the largest regions in New Zealand. Southland's land area is 34,000 km² and Otago's is 32,000 km².

² Ministry of Business, Innovation and Employment (MBIE) Regional Economic Activity Report (REAR) report. 2015.

³ See the University of Otago's Annual Economic Impact Report for 2015.

⁴ Queenstown Lakes District Council land transport activity management plan 2018/19 – 2032/33. September 2017.

Stretching from the Waitaki River in the north to the Brother's Point / Waiparau Head in the Catlins, Otago is bounded by the Southland, Canterbury and West Coast regions, and to the east by the Pacific Ocean. Southland region, covering the south of the South Island plus Stewart Island, is flanked by coastal waters on the east, south and west. To the north, Southland adjoins Otago and, in the northwest corner at Awarua Point, the West Coast region.

The Otago region has:5

- 1,300 km of state highway (managed by NZTA)
- 9,219 km of local roads (managed by TAs), 39.5 per cent of which is sealed
- 279 km of main trunk rail line and 10 km of branch line
- Two urban bus networks and long-distance buses between Otago towns and to other regions.

The Southland region has:1

- 777 km of state highway (managed by NZTA)
- 6,418 km of local roads (managed by TAs), 41.3 per cent of which is sealed
- 90 km of main trunk rail line and 105 km of branch line
- One urban bus network and long-distance buses between Southland towns and to other regions.

Figure 1 shows the state highways in Otago and Southland. Figure 2 shows key freight and tourism journeys; local roads connects these journeys with local businesses and communities.

The key tourism and (internal) freight journeys, which are shown on Figure 2, are:

Freight journeys

- Timaru Invercargill: SH 1 via Clinton, Mataura to Invercargill.
- Timaru Invercargill: SH 1 via Gore, Mataura to Invercargill.
- Christchurch Queenstown: SH1, SH8, SH 79, SH8, SH6 and SH 6A.

Tourist journeys

- Haast Milford Sound: SH6, Kawarau Gorge, SH6, SH97 and SH94.
- Haast Milford Sound: SH6, SH84, Crown Range Road, SH6 and SH94 to Milford Sound.
- Omarama Milford Sound: SH83, SH6, SH97, SH94 to Milford.
- Dunedin Te Anau (Southern Scenic Route): SH1 to Balclutha, Owaka, Papatowai, (plus alternate route via Purakanui Falls), Chaslands, Niagara, Gorge Rd, Invercargill, SH1, SH6, SH99, Clifden, Blackmount, Manapouri and Te Anau.

Large parts of Otago and Southland are within three national parks, with limited roading: Fiordland National Park (New Zealand's largest national park) and Rakiura National Park on Stewart Island, are in Southland. Aspiring National Park is partly in Otago and partly in the West Coast region.

⁵ Ministry of Transport statistics for roads available at <u>http://www.transport.govt.nz/ourwork/tmif/infrastructureandinvestment/;</u> the measures of state highways are for 2014/15 and the measures of local roads are for 2013/14. For rail: Neil Campbell, KiwiRail Dunedin, *pers. comm.* 27 January 2015.

Modes of travel

Land transport in Otago and Southland is mainly road-based and focused on the use of private cars and trucks e.g. as illustrated by responses in the last census, summarised in Table 4. It is likely that road transport will continue to be the primary mode of transport in the years to come.

In the 2013 census, areas that were mostly rural had higher proportions of people working at home. Southland district had the third highest proportion of employed people working at home, for all NZ territorial authorities – 25 per cent (3,897 people), see Table 4.

The appendix sets out in detail the role the RTCs expect each mode of transport take under these RLTPs.

	Percentage of people in each district travelling to work by a particular mode, census day, 2013 (%)									
District/city	Drove a private car, truck or van	Drove a company car, truck or van	Passenger in a car, truck, van or company bus	Public bus	Motor or power cycle	Bicycle	Walk- ed or jogged	Work- ed at home	Did not go to work that day	
Central Otago	42	17	4	0	1	4	7	14	11	
Clutha	44	11	5	0	3	1	6	20	9	
Dunedin	51	10	5	3	1	2	9	6	12	
Gore	49	14	4	0	1	2	6	13	11	
Invercargill	56	13	6	1	1	2	5	4	12	
Queenstown Lakes	43	13	3	1	1	3	11	11	12	
Southland	36	12	3	0	6	1	6	25	10	
Waitaki	46	12	4	0	2	2	7	14	12	

Table 4: Percentage of people travelling to work by a particular mode

Source: Statistics NZ table builder

On and off-road cycle network

There are urban cycle networks in Dunedin and Invercargill. Queenstown is currently planning how to expand its incipient commuter cycling network.

The two regions have an extensive off-road cycle network, which is economically important. The network includes both official and unofficial trails. There are around 500 km of official trails, including several Great Rides, listed below:

- Alps 2 Ocean Cycle Trail
- Around the Mountain Cycle Trail

- Clutha Gold Trail
- Otago Central Rail Trail
- Roxburgh Gorge Trail
- The Queenstown Trails.

Several other trails are under construction or planned to connect Dunedin and Queenstown via Lawrence.

There is one Heartland Ride that is partially in Otago and partially in Southland: along SH6, on the West Coast road, to Wanaka. Heartland Rides aim to encourage cyclists away from busy state highways and onto scenic, quiet, back-country roads where they will experience heartland New Zealand.

The roading network

The two regions have an extensive network of state highways and local roads, as well as a freight rail connection linking Invercargill and Dunedin. Key transportation routes cross Otago and Southland, linking cities and towns in Otago and further north with those in Southland.

Figure 1 shows the infrastructure links between Otago and Southland, West Coast and Canterbury. One of these key links, SH1, runs north-south along the eastern coast of Otago, through key population centres in Southland, ending at the bottom of the Southland region at Stirling Point. This state highway provides the key transport link for internal freight, export freight and movement of people through the South Island. As such maintaining this link is considered critical to the whole South Island transport network.

SH6, SH8 and SH90 provide links between inland Otago, Southland, West Coast and Canterbury.

The remaining state highways in Otago and Southland form strategic links throughout the region for freight, visitors, and other traffic.

SH6 and SH94 connect two of New Zealand's iconic tourist destinations: Queenstown and Milford Sound. SH6 also provides the key links into and out of Queenstown: east to Cromwell and south to Invercargill. It is worth noting that just over half of all visitors are believed to be arriving in Queenstown by road (although there is no current, reliable evidence on this).

Most of the freight to Queenstown comes from Christchurch on SH6 over the Lindis Pass and via Cromwell, which acts as a freight hub. Smaller trucks are then used to distribute the goods to Queenstown along SH6.

A large proportion of the roading network within Otago and Southland is local roads (rather than state highways): 88 per cent in Otago and 89 per cent in Southland. On Stewart Island, the short network of roads is part of Southland District Council's roading network.

The extensive local network across the two regions is vital for travel across the large land area, for carrying freight link between farm gate and the state highway network, and for linking to Port Otago and South Port.

This extensive road network in Otago and Southland, combined with a sparse population and the rising costs of road maintenance, places a relatively high burden of road maintenance on the population.

Generally, the capacity of the road network in Otago Southland is adequate, except in the Queenstown area. While most of the congestion in the Queenstown is confined to the state highways at present, the capacity of the network is under pressure.

Until recently, the forecasted increase in freight (which has been based on increasing visitor numbers and on anticipated population growth) has been expected to come within the capacity of SH 6, from Queenstown east to Cromwell, to handle. But two issues have highlighted the need to revisit this assumption. The first is Queenstown Airport Corporation's master planning, which has identified the desirability of a dual airport approach of a "one airport business, two complementary airports", using both Wanaka and Queenstown airports to support economic growth across Otago. The second is the realisation that the projections of visitor numbers currently used for transport modelling in Queenstown need to be revisited as they are probably underestimating the rate of growth in visitors⁶.

Private vehicle use dominates transport in Queenstown, with public transport and alternative transport modes comprising a small proportion of total trips. The critical elements of the transport system are SH6A connecting the airport at Frankton with Queenstown, and the network within the Queenstown CBD itself. Growing traffic demand, coupled with narrow streets and limited vehicle capacity within the town centre, constrains the dispersal of traffic entering the town from SH6A. This will continue to cause significant traffic congestion, particularly during the afternoon/evening peak period and during the winter, until rectified with better use of public passenger transport and active transport, coupled with some improvements in transport infrastructure.

To this end, the recently-completed programme stage of the business case being developed for Queenstown integrated transport proposes managing travel demand by addressing car dominance in Queenstown and thereby optimising the existing transport infrastructure. This optimisation focuses on improving the use of the existing network through both public transport interventions and use of technology. Proposed improvements to public transport include the introduction of bus priority along the SH6A corridor, the introduction of public transport hubs and park and ride services. The application of technology aims to improve network productivity through the introduction of Mobility as a Service and workplace travel plans⁷.

Private vehicle use dominates transport in Dunedin as well, with public transport comprising only a small proportion of total trips. Trips by active modes make up a significant contribution in some locations (particularly the city centre and North Dunedin) due to the comparatively short distances and flat terrain. In capacity terms, the Dunedin transport network is generally fit for purpose with sufficient capacity to cope with demand.

Southland's transport system is broadly fit for purpose as well. Although the main roads in Southland are largely sealed, some of the tourist roads, particularly in western and southwestern Southland, have variable levels of service.

The rail network

The railway line south of Christchurch, the Main South Line, mirrors the route of SH1 along the eastern coast, linking coastal towns and cities, including Timaru, Oamaru, Dunedin, Gore, Invercargill and Bluff. In Otago and Southland, this line is used primarily for freight

⁶ Tony Sizemore, NZTA, *pers. comm.* 12 October 2017.

⁷ Queenstown Integrated Transport Strategy. Item 10 Queenstown Lakes District Council Agenda, 28 September 2017: see <u>http://www.gldc.govt.nz/assets/Uploads/Council-Documents/Full-Council-Agendas/2017/28-September-2017/10a.-</u> <u>Attachments-Queenstown-Integrated-Transport-Strategy.pdf</u>.

transport. Freight rail services are an important means of transferring bulk and containerised freight to and from Port Chalmers and South Port at Bluff. There are branch lines to Ohai (used to transport coal) and through the Taieri Gorge (used for visitor excursions).

Of the various inter-regional rail origin-destination trips nationally, Southland to Otago is the fourth largest in terms of tonnage (748,000 tonnes in the 12 months to April 2017). Trips within Otago are ninth largest at 500,000 tonnes over the same period. Of the product types carried, milk and dairy products, and shipping containers, feature large in both Southland-Otago and Otago-Otago origin-destination trips⁸.

Rail moves significant volumes of bulk and containerised freight into Port Chalmers; around 60 to 65 per cent of exports arriving at this port come by rail⁹. (The funding of rail falls outside of these two RLTPs and the National Land Transport Fund, however.)

Airports

Queenstown, Dunedin, Invercargill, Te Anau, Wanaka, Alexandra, Oamaru, Balclutha, Stewart Island and Milford Sound all have regional or local airports, with the Queenstown and Dunedin airports also providing international services.

The three main airports, Queenstown, Dunedin and Invercargill, are shown on Figure 1.

Up to 45 per cent of all visitors to Queenstown are believed to be arriving by air (there is little reliable, current evidence on this). Queenstown International Airport is located on the Frankton Flats besides Lake Wakatipu. This airport has experienced the fastest growth rates for both international and domestic passengers of all NZ airports, and over the last decade has overtaken Dunedin to become the fourth busiest airport in NZ in terms of passenger numbers for domestic and international passengers combined¹⁰. The domestic service between Queenstown and Auckland was the fourth busiest of all domestic services nationally in 2016, carrying 967,000 passengers². This airport handled 1,779,867 passengers in 2016, up 18 per cent on the previous year. Of these 508,902 (29 per cent) were international arrivals or departures¹¹.

Dunedin International Airport is located approximately 35 km south west of the City. In SH1 and SH86 provide the key connection between the city and airport.

In 2016, Dunedin airport received 909,624 passengers, including 49,964 international visitor arrivals¹². Dunedin is the sixth largest airport in New Zealand for domestic passengers².

Invercargill airport is the 12th largest airport in New Zealand in passenger numbers terms^{2.} It handled 289,836 passengers in the year ending 30 June 2016, up 4.3 per cent on the previous year¹³.

Ports

Port Otago, at Port Chalmers in Dunedin, is New Zealand's fifth largest port (by value) with over \$3,500 million worth of exports in 2015, mainly primary commodities originating from the

⁸ See: <u>http://www.transport.govt.nz/sea/figs/rail/</u> Accessed 15 September 2017.

⁹ Peter Brown, Port Otago *pers. comm.* 4 December 2017.

¹⁰ New Zealand Transport Outlook Current State 2016. Ministry of Transport. 2017.

¹¹ See <u>http://www.queenstownairport.co.nz/corporate/airport-statistics</u>

¹² 2016 Annual report. Dunedin Airport.

¹³ Annual report 2016. Invercargill airport.

Southland and Otago regions. Port Otago is a freight port for regional and international import/export and a key South Island port, exporting containerised produce from throughout Otago and Southland.

South Port at Bluff is the southern most commercial port in New Zealand. It services Southland's export and import industries, with bulk non-containerised cargo making up the majority of tonnes handled, and is vital for the economic wellbeing of the Southland region. South Port is New Zealand's seventh largest port by gross weight handled (Port Otago is tenth).

The locations of these ports are shown on Figure 1.

2.2 Drivers of change

Summary

The key drivers of change in transport activity in southern New Zealand, discussed in this section, are:

- population growth and changing demographics
- growth in tourism and changing patterns of tourist travel
- regional economic development initiatives, especially opportunities to benefit from tourism growth
- access to the back country
- intensification and land use changes, including forestry
- port activity
- changing technology
- changing awareness and expectations of risk including climate change
- emerging demand for active travel.

Projected changes in population and demography

Both regions are sparsely populated compared to New Zealand as a whole. Otago's main population centres are along the east coast and around the central lakes. Southland's main centres of population are along the southern coast and inland near the border with the Clutha District, with smaller towns towards the eastern edge of Fiordland National Park.

Otago's population is projected to reach 225,800 in 2018 (4.6 per cent of the national population); and Southland's population to reach 99,200 (2.0 per cent of the national population): see Table 5.

Table 5: Present and projected population of the Otago and Southland regions

Projected population under Statistics NZ medium growth scenario								
Region	2017	2018	2023	2028	2033	2038	2043	
Otago	224,200	225,800	236,000	242,700	248,300	252,700	256,100	
Southland	98,300	99,200	100,100	100,600	100,600	100,000	99,000	

Source: Statistics NZ website, accessed 14 September 2017; Present population is provisional 2017 figure, accessed 2 November 2017.

Regionally, Southland's population is forecast to be relatively static out to at least 2043 while Otago's is projected to grow at 0.7 per cent per annum primarily based in the Queenstown Lakes area (noting, this could be higher if Queenstown grows faster than the medium growth scenario predicts).

There is an increasing number of people on fixed incomes (in part due to the aging population). This is likely to affect the ability of territorial and regional councils to fund the transport system through rates.

Table 6	6:	Present	and	projected	population	for	territorial	authorities	in	Otago	and
South	an	d									

Projected population under medium growth scenario									
District/City	2017	2018	2023	2028	2033	2038	2043		
Clutha	17,550	17,600	17,550	17,500	17,300	17,000	16,500		
Central Otago	20,300	20,500	21,400	22,200	22,900	23,300	23,600		
Dunedin	128,800	129,000	132,000	133,900	135,300	136,200	136,500		
Gore	12,450	12,500	12,400	12,300	12,100	11,800	11,450		
Invercargill	54,800	55,300	55,900	56,300	56,300	56,000	55,500		
Queenstown Lakes	37,100	38,300	44,000	47,700	51,100	54,300	57,400		
Waitaki	22,200	22,300	22,800	23,300	23,600	23,900	24,100		

Source: Statistics NZ website, accessed 14 September 2017. Present population is provisional 2017 figure, accessed 2 November 2017.

Table 7: Projected population for urban areas in Otago and Southland

Urban area	Actual population	Projected population under Statistics NZ medium growth scenario							
	2013	2018	2023	2028	2033	2038	2043		
Dunedin	115,100	120,100	122,800	124,500	125,700	126,500	126,700		
Oamaru	13,400	13,900	14,100	14,200	14,300	14,400	14,400		
Queenstown	12,100	14,200	15,100	15,900	16,500	17,200	17,800		
Waikouaiti	1,200	12,00	1,200	1,200	1,200	1,200	1,100		
Milton	2,000	2,000	1,900	1,900	1,900	1,800	1,700		
Balclutha	4,000	3,900	3,800	3,700	3,600	3,500	3,300		
Alexandra	4,900	5,200	5,300	5,400	5,500	5,500	5,500		
Cromwell	4,300	5,100	5,300	5,600	5,700	5,800	5,900		
Wanaka	6,800	9,300	10,600	11,400	12,100	12,700	13,300		
Arrowtown	2,600	2,900	3,000	3,200	3300	3400	3,500		
Invercargill	49,300	51,300	51,800	52,100	52,000	51,700	51,100		
Winton	2,300	2,300	2,300	2,300	2,300	2,300	2,300		
Gore	9,800	9,900	9,800	9,700	9,500	9,200	8,900		
Bluff	1,800	1,800	1,800	1,800	1,800	1,800	1,800		
Te Anau	2,000	2,100	2,200	2,200	2,200	2,200	2,200		
Riverton	1,500	1,500	1,400	1,400	1,400	1,400	1,300		

Source: Statistics NZ website access 14 September 2017

Although many parts of Otago's population are relatively stable or declining over the last 10 or so years, population growth in Queenstown Lakes and Central Otago has been among the highest in New Zealand. Growth is predicted to continue in these areas, and the pressure this creates is discussed below.

Tables 7 and 8 show the population growth forecast for urban areas in Otago and Southland, in absolute terms and as a percentage on the 2013 population. Table 11 shows Wanaka is projected to grow fastest, followed by Queenstown and Cromwell. This trend is already evident today.

 Table 8: Projected population growth for fastest growing urban areas in Otago and

 Southland, in percentage terms compared to 2013

Urban area	Projected growth (%) (medium growth scenario)				
	2013-23	2013-43			
Wanaka	56	96			
Queenstown	25	47			
Cromwell	23	37			
Arrowtown	15	35			
Alexandra	8	12			
Te Anau	10	10			
Dunedin	7	10			
Oamaru	5	7			
Invercargill	5	4			

Source: Statistics NZ table builder, accessed 14 September 2017

Table 8 highlights the need for forward planning of Wanaka's transport system, so that this area, as it grows, does not experience the congestion issues faced by Queenstown in recent years.

Note, for Queenstown Lakes, the medium growth scenario projections in Table 6 forecast a slower growth rate than QLDC's own growth projections do¹⁴. The latter fit better with the rates of growth currently being seen in this area. So, the population projections for Queenstown in Tables 6, 7 and 8 should not be relied on and are included only for comparative purposes. The next sub-section discusses this matter further, and includes the growth projections for Queenstown that QLDC considers to be more realistic than Statistics NZ's medium growth projections.

As in most of New Zealand, an aging population is predicted for Otago and Southland. Therefore, the provision of access and mobility through reliable transport services will become of increasing importance.

Dunedin's population is comparatively young however, due to the annual influx of students to Otago University and Otago Polytechnic. Around 21.5 per cent of the city's population is aged between 15 and 24 years in the 2013 census, compared to the national average of 14.1 per cent.

¹⁴ See: QLDC growth projections to 2058. Resident population, visitors, dwellings, rating units. Rationale. June 2017.

The age profile of population of Queenstown Lakes is also unusual in that the percentage of the total population in the 25-44 age bracket (36 per cent) is much higher than in other districts and cities in Otago Southland (24 per cent) or in New Zealand as a whole (26 per cent).

Growth of the Queenstown Lakes area

The Queenstown Lakes area is New Zealand's premier tourism destination. Although the resident population of Queenstown is relatively small, growing numbers of overseas and domestic visitors boost this significantly.

As the fastest growing district in New Zealand, the population of Queenstown Lakes is increasing at around seven per cent per annum. Much of the growth is concentrated on Queenstown and its surrounds, and in Wanaka. Queenstown is one of the five high-growth urban areas identified in the National Policy Statement on Urban Development Capacity.

The district is forecast to continue to receive strong growth in both residential population and tourist visits. Tables 7 and 8, above, which show the growth projected in the urban areas in southern NZ, highlight the growth expected in the Queenstown Lakes and Central Otago area. The actual growth in these tables is probably an underestimate. Historically, the growth in Queenstown has always been underestimated. The best-available estimate of projected growth in Queenstown is probably the high growth projection prepared for QLDC in 2017.

Over the next 30 years, the population of the greater Queenstown Lakes area is projected to increase from 29,730 in 2013 to a forecast 66,355 by 2048 (see Table 9 below). Visitor numbers are expected to grow at an even faster rate.

Number of:	2013	2018	2018	2048	2058	Average annual growth rate, 2018-2028 (%)
Usually resident population	29,730	38,048	49,277	66,355	74,731	2.6
Total visitors (average day)	17,982	24,861	31,488	39,037	42,055	2.3
Total visitors (peak day)	63,879	79,301	99,747	126,374	138,658	2.3
Total dwellings	15,800	19,718	24,674	31,595	35,030	2.4

Table 9: Expected growth in Queenstown Lakes District (the high growth scenario)

Source: High growth projection in QLDC growth projections to 2058. Rationale. June 2017¹⁵

The rate of growth being experienced in the district is challenging the ability of the transport system to maintain accessibility, connectively and, more generally, protect the liveability of the area for residents.

The Queenstown economy is driven by tourism and the increasing demand for infrastructure and services to support the growing numbers of people. The major employers in Queenstown are the construction and service sectors, particularly accommodation, food

¹⁵ QLDC growth projections to 2058. Resident population, visitors, dwellings, rating units. Rationale. June 2017.

services and the retail trade. These two sectors are expected to continue to underpin forecast employment growth.

Mountains, lakes and rivers surround Queenstown, placing physical constraints on the growth of the town centre. Much of the projected growth in population and business can be expected to occur in and around Frankton. The Frankton business park is likely to provide the hub for the construction and commercial activities that support future Queenstown growth.

Since 2005, visitor numbers through Queenstown airport have increased by 200 per cent to nearly 1.8 million passengers in the year to June 2017. Sustained growth is forecast for Queenstown Airport Corporation. If growth at Queenstown airport was not constrained by airport capacity or the noise restrictions, total passenger movements could theoretically reach 3.2 million by 2025 and 7.1 million by 2040¹⁶.

In community engagement in its master plan, the Queenstown Airport Corporation is looking at three options, one of which caps passenger movement at 3.2 million per annum, and two which cap it at 5.1 million per annum. Moving to the dual airport option, using both Queenstown and Wanaka airports would allow growth beyond 5.1 million passenger movements per annum.

This is also likely to lead to increased use of the Kawarau Gorge and Crown Range route by visitors. The Queenstown Airport Corporation has signalled the desirability of moving to a "one airport business, two complementary airports" approach, using both Queenstown and Wanaka airports¹⁷. In April 2017, Queenstown Lakes District Council decided to grant the Corporation a long-term lease for Wanaka Airport.

Along with a potential increase in day flights, night flights are expected to be introduced to Queenstown Airport (evening flights are already in place). These changes would increase both peak and off-peak movements in the traffic network¹⁸.

The freight task is also expected to grow over time, in line with the projected population growth: particularly the movement of manufactured and retail goods, construction materials and waste. The Frankton business park is likely to provide a hub for construction and retail activities to support Queenstown's growth, and will remain the focus for heavy vehicle movements into Queenstown¹⁹.

The significant population growth projected from the Queenstown area will lead to increased demand for residential and commercial properties, land use and increased volumes of traffic, placing the transport system under even greater pressure²⁰.

Projected visitor numbers

Growth in visitor numbers affects transport demand both directly (e.g. extra coaches, campervans and rental cars on the road, increased use of public transport on routes serving tourist destinations) and indirectly (e.g. an increased workforce placing extra pressure on commuter routes and travel to/from new satellite housing developments).

¹⁶ Queenstown Airport Corporation Ltd – Queenstown Airport Masterplan (2017).

¹⁷ Queenstown Airport Corporation Ltd – Queenstown Airport Masterplan (2017).

¹⁸ Queenstown Integrated Transport Strategy, see <u>http://www.qldc.govt.nz/assets/Uploads/Council-Documents/Full-Council-Agendas/2017/28-September-2017/10a.-Attachments-Queenstown-Integrated-Transport-Strategy.pdf.</u>

¹⁹ Queenstown to Rangitata corridor management plan 2018-2028. NZTA 2017.

²⁰ Queenstown Integrated Transport Strategy, see <u>http://www.qldc.govt.nz/assets/Uploads/Council-Documents/Full-Council-Agendas/2017/28-September-2017/10a.-Attachments-Queenstown-Integrated-Transport-Strategy.pdf.</u>

Projected visitor numbers for Otago and Southland regions are not available at either regional or pan-regional scale. MBIE no longer provides forecast at this scale.

Queenstown visitor numbers are projected to grow at around 2.9 per cent per annum on an average day, and around 2.5 per cent per annum on a peak day (under the high growth scenario shown in Table 9)²¹.

Central Otago development

Growth in Queenstown Lakes District directly affects development along the corridor around Cromwell, Clyde and Alexandra. Increasing land prices and housing costs in Queenstown are encouraging lower income residents to relocate to neighbouring areas within commuting distance of Queenstown, increasing traffic volumes through the Kawarau Gorge²². Displacement of residential growth outside Queenstown due to high land prices and housing costs is projected to increase²³.

Cromwell acts as a service and retail gateway to central Otago and the Southern lakes area. As tourism grows, the commercial and industrial hubs are expanding to support this growth. Alexandra's industrial hub is also expanding to support Queenstown's growth. This trend will increase commercial traffic on the corridor between Alexandra and Queenstown, making it challenging to maintain consistent levels of service on this journey²⁴.

Regional development in Southland

The SORDS Action Plan has identified three main challenges to enable social and economic development over the next decade: to grow the population, diversify the economy and strengthen local business²⁵. The action plan identifies transport as being one of the enablers of population growth, by providing for rural transport and bulk haulage to South Port, to meet increasing tourist traffic and to support town/city redesign in Invercargill and Gore.

Southland faces a projected fall in its population: see tables 5, 6 and 7 above. Parts of Southland face depopulation, not just urban areas such as Gore and Riverton (see projections in Table 7 above) but also smaller areas such as Ohai and Nightcaps.

Nevertheless, Southland region is hosting increasing numbers of visitors. Tourism traffic to the region is likely to be hubbed from Queenstown for the foreseeable future, and the connection to Queenstown will become increasingly important. Although traditional destinations such as Queenstown and Milford are experiencing significant increases in traffic, visitors are also increasingly travelling independently and exploring places that are more out-of-the-way.

Growing visitor numbers pose a challenge, raising questions around whether parts of the transport network will meet the requirements of increased tourist traffic, as well as around the compatibility of tourism and rural heavy traffic on some roads.

²¹ Rationale (2017), Queenstown Lakes District projections for resident population, dwellings and rating units to 2065.

²² Milton to Cromwell corridor management plan 2018-2028. NZTA 2017.

²³ Queenstown Integrated Transport Strategy, see <u>http://www.qldc.govt.nz/assets/Uploads/Council-Documents/Full-Council-Agendas/2017/28-September-2017/10a.-Attachments-Queenstown-Integrated-Transport-Strategy.pdf</u>

²⁴ Milton to Cromwell corridor management plan 2018-2028. NZTA 2017.

²⁵ Southland Regional Economic Development Strategy (SORDS) Action Plan.

Dunedin's development

Dunedin city is well positioned to build on the strength of the existing education and health sectors to develop high value niches within the health technology, biotechnology, food processing, manufacturing, engineering and ICT sectors. There is also scope to increase the contribution that tourism makes to the economy of Dunedin and surrounding areas.

Future population growth is expected to be concentrated in the Mosgiel, Wingatui and Saddle Hill areas to the west of the city, and further intensification in the central city e.g. the Warehouse Precinct. In contrast, economic and employment growth is expected to be focused in the city centre and around the tertiary campus in North Dunedin, and Anderson Bay Road in South Dunedin.

Several initiatives are likely to shape the central city area: The University of Otago's \$650m investment in infrastructure over 15 years from 2014, the Southern District Health Board rebuild of Dunedin hospital (the DHB are looking at the options of rebuilding on the same site, a nearby site or relocating the hospital elsewhere in the city) and delivery of Dunedin City Council's Central City Plan.

Back country access

Several local roads in Otago and Southland provide well-used access to the back country e.g. to the Routeburn, Dart, Rees and Hollyford Tracks, the Matukituki Valley, the Motatapu track, the Hump Ridge Track and various access points for the Te Araroa Trail. Traffic volumes on these roads are growing as track usage (including day walking / running) increases.

The roads that access the back country are largely unsealed, making them unsuitable for growing traffic volumes and for visitors who are only used to driving on sealed roads. Moreover, councils receive no rates income from the Crown Estate (national parks and other protected land) that generate much of the traffic on these access roads.

Over the past decade, a significant amount of high country has been dedicated as conservation estate (e.g. in Central Otago), increasing the pressure to maintain roads that were previously maintained by landowners for their own use²⁶.

Intensification and landuse changes

In southern New Zealand, the maturation of forests to be harvested is expected to drive increased freight movement and increase pressure on the road network. The greatest impact that forest production has on roads is during the harvesting period, when logs are carted to processing plants or export. There can be significant deterioration of roads when large volumes are harvested around the same time from one or more forests, or from a large number of smaller blocks in the same geographical area. Waitaki District faces this situation, with a wave of forest harvesting due in ten years' time.

Although there is a trend towards on-farm wintering undercover in Southland, off-farm wintering of dairy herds (dairy support) is likely to continue, placing pressure on the road network. In Southland, there is opportunity for further conversion of dry stock land to dairy farming. DairyNZ estimates that approximately a third of the land that could be used for dairying (Land Use Classification Class 1-3) is currently being milked on (164,000 hectares). A further 43,000 hectares of land (Land Use Classification Class 4-8) is also currently milked

²⁶ Central Otago District Council Activity Management Plan 2017.

on. DairyNZ does not, however, estimate expansion in the latter areas. The rate at which conversion to dairy occurs in Southland is likely to be largely dictated by international commodity prices of dairy compared to other industries, land prices relative to other regions, and environmental regulation or compliance rules ²⁷. Regional plan provisions are being finalised and are likely to restrict land availability.

There is little available data about projected dairy conversions in Otago. Anecdotally, there is an increasing trend to dairy support (beef and cropping farmers taking dairy herd over winter). Increasing dairy farming activity is believed to be occurring in Maniototo, Manuherikia and the Roxburgh area²⁸. Additionally, the intensification of land use from investment in irrigation is seeing previously arid land now being used for dairy farming and cropping (e.g. along areas of SH82 and SH83 along the northern edge of Waitaki District).

As land use changes in such areas, the journey experience changes, impacting tourists, local communities and freight operators. To avoid adverse impacts on these customers, both the pace of this change and the areas of the transport system where infrastructure is no longer fit-for-purpose, need to be identified. Unless pro-actively managed, this type of change could potentially cause assets to deteriorate faster than previously expected²⁹.

Port activity

Since primary production and processing is likely to continue to be a key economic driver in Otago and Southland, high quality access to the ports and airports will continue to be important to the success of the wider Otago and Southland economies.

The volumes of freight being moved are projected to increase steadily³⁰. The corridor to South Port has the capacity to cope with increases in freight projected³¹. Rail already moves significant volumes of bulk and containerised freight into Port Chalmers. Demand for road access to interface with rail services will place increasing pressure on the roading corridor³². Increasing heavy traffic volumes on SH88, a commuter route between Port Chalmers and Dunedin, which traverses residential areas, pose safety concerns for the local community.

Changing technology

The changing nature of technology is expected to drive change – not just emerging transport technologies such as autonomous vehicles, but information technology in general. Smart phone technology is providing better travel information for those travelling, e.g. for rapid notification of events, road conditions and delays, as well as for real time information about bus services. Use of webcams and weather stations on the network – on passes for instance and the Crown Range Road – is providing travellers with a real-time view of road conditions there, to help with their travel decision-making. This type of technology advance is likely to continue. Sensors and robotics are also changing the transport sector by enabling more automation.

²⁷ Moran, E., Pearson, L., Couldrey, M., and Eyre, K. (2017). The Southland Economic Project: Agriculture and Forestry. Technical Report. Publication no. 2017-02. Environment Southland, Invercargill, New Zealand. 340pp. Report available at <u>https://contentapi.datacomsphere.com.au/v1/h%3Aes/repository/libraries/id:1tkqd22dp17q9stkk8gh/hierarchy/Scientific%20reports/Agriculture%20and%20Forestry%20Report.pdf.</u>

²⁸ Central Otago District Council Activity Management Plan 2017.

²⁹ Queenstown to Rangitata corridor management plan 2018-2028. NZTA. 2017.

³⁰ See: Forecasts for the Future - National Freight Demands Study. Ministry of Transport updated 1/12/2015 <u>http://www.transport.govt.nz/research/nationalfreightdemandsstudy/forecastsforthefuture-nationalfreightdemandsstudy/</u> , updated 1/12/2015.

³¹ Southern Arterial & primary Collection Cluster corridor management plan 2018-2028. NZTA. 2017.

³² Christchurch to Dunedin corridor management plan 2018-2028. NZTA. 2017.

The use of electric cars is increasing steadily slowly albeit from a small base. Electric vehicle charging stations are being installed across parts of the network, and their prevalence is likely to increase.

Changing awareness and expectations of risk including climate change

There is growing awareness about the threat that climate change and other issues pose to network resilience and thus to community resilience, especially in areas where change is already visible e.g. the coastal erosion alongside the Katiki Straight on SH1 in North Otago.

Climate change poses a major challenge to Dunedin. Low lying terrain in South Dunedin means around 2,683 houses, 116 businesses and 35 km of road are vulnerable to sea level rise (being less than 50 cm above sea level). The magnitude of this exposure to risk from sea level rise is significantly higher in Dunedin than in other New Zealand centres³³. The increased frequency of weather events, especially rainfall, is impacting the resilience of the transport network, as land instability causes a greater number of road closures.

Other such issues include the disruption to transport that large scale natural hazard events such as earthquakes and landslips can cause. The Christchurch and Kaikoura earthquakes have heightened community awareness of the need to pre-actively plan for this type of event in Otago Southland. Growing awareness around the impact of an earthquake on the Alpine Fault has led to a regional, multi-agency approach to understanding more about community resilience and to improved organisational preparedness.

Community awareness about road risk is also changing, as the *Any Number is Too Many* campaign is showing³⁴; this change in awareness of road risk is also evident in calls for safer roads in districts such as Waitaki.

Emerging demand for active travel

There is emerging demand for safe walking and cycling infrastructure and an interconnected network of medium to long distance walkways and cycleways. Research undertaken by Ben Wooliscroft from Otago University has showed that many New Zealanders do see roads as more than just car places, and are supportive of measures to improve walking and cycling. According to this research, there's a strong groundswell of support for prioritising active transport in NZ³⁵. We are seeing this groundswell in Dunedin and Queenstown, in particular³⁶, through the respective consultations undertaken by the city and district councils, for example.

 ³³ Preparing New Zealand for rising seas, report of the Parliamentary Commissioner for the Environment. 19 November 2015, available at http://www.pce.parliament.nz/publications/preparing-new-zealand-for-rising-seas-certainty-and-uncertainty.

³⁴ See: <u>anynumberistoomany.org</u> and the Waitaki District Council transport activity management plan.

³⁵ September 2017 eBulletin of Living Streets Aotearoa report of the New Zealand Walking Summit July 2017.

³⁶ See the Activity management plans for Dunedin City and Queenstown Lakes District Councils.

2.3 The key problems facing the transport system today

The key problems

The Committees used the process of intervention logic mapping, coupled with targeted consultation with representative groups of land transport users and providers, to identify the three key problems facing land transport in Otago Southland. The Transport Agency independently identified the problems and opportunities on the regions' state highways.

The three key problems identified by the RTCs are:

- inability to assess, plan, fund and respond to changing mobility user demands in a timely way, as this is resulting in some poor investment prioritisation and decisions, and inadequate future-proofing
- attitudes and behaviour, together with inconsistent quality of routes in the two regions, which are resulting in fatal and serious injury crashes
- parts of the network are vulnerable to closure from adverse events, which is resulting in economic and social disruptions, of which there is increased recognition.

Additionally, NZTA has identified problems on the regions' state highways.

The rest of this section summarises the evidence base for the first three problems, then lists the problems facing the state highways. The draft State Highway Investment Proposal 2018-21 and corridor management plans summarise the evidence base for the latter³⁷.

Explanation and evidence base for the key problem statements

Problem 1: Inability to assess, plan, fund and respond to changing mobility user demands in a timely way results in some poor investment prioritisation and decisions, and inadequate future-proofing.

A complex set of issues continue to threaten our ability to assess, plan, fund and respond in a timely manner to changing demand for mobility and transport. With so many factors driving change in the transport activity in southern New Zealand, it is not surprising we are experiencing this problem. The nature and rate of change are making timely investment challenging. Pressure on the public funding of the transport system, coupled with the type and rate of change occurring in Otago and Southland, all challenge the ability of our transport system to keep up with demand.

The systems used in public sector transport planning are part of this challenge. For example, the RTCs are concerned NZTA's introduction of a business case approach to planning and investment decision-making, designed to deliver better investment decisions, has resulted in an even more protracted planning process. The inflexibility of the funding model means we are often looking for workarounds rather than redesigning the system to be fit-for-purpose. Inadequate integration of data sources (e.g. tourism data, transport data, and various road trauma data sets) results in sub-optimal planning and priority setting.

Additionally, there is a broader issue concerning a paucity of suitable governance structures at the South Island, regional and inter-district levels for addressing those areas that cross-over between transport and economic development (including cycleway networks and tourist travel in general).

³⁷ Available at <u>https://www.nzta.govt.nz/planning-and-investment/201821-national-land-transport-programme/state-highway-investment-proposal/</u>.

Examples of when the timing of investment has raised public concern in recent times include:

- improving Queenstown's public transport services (*improvements started November* 2017)
- easing severe traffic congestion in Frankton Road (SH6) (extra lane provided on the BP roundabout, autumn 2017)
- allowing traffic from Quail Rise to join SH6, Queenstown (underway)
- completing the SH88 shared path between Port Chalmers and Dunedin
- delivering on the vision in Dunedin City Council's Economic Development Strategy to make Dunedin one of the world's great small cities, through attention to such matters as connectivity (e.g. transfer of goods, services, people) and services - including transport - that make a city attractive and safe for living and working
- providing safe cycleways and lanes to fulfil the latent demand for cycling in Dunedin city (underway)
- constructing the pedestrian and cyclist underpass beneath the state highway at Clyde (completed)
- making safe the intersection of SH1 and the access road to Moeraki (action now taken)
- safety improvements to state highways in Southland region.

The result is sub-optimal investment decision-making results, which in turn causes inadequate future-proofing. This inadequate future-proofing can hinder us:

- catering to the demographic profile of our communities including the aging population
- providing for the different modes of travel sought by our communities (e.g. cycling)
- meeting visitor needs and addressing the pressures that increasing tourist numbers put on our communities and transport network
- potentially, unless we upgrade our systems, addressing the effects of sea-level rise on the transport network.

It has proved difficult to keep our planning ahead of the rate of growth of parts of Otago, given the growth in population and thus in traffic volumes described in the previous section. Traffic congestion in Queenstown is one manifestation of insufficiently rapid response to growth. Wanaka could be the next town to experience gridlock, unless we make our systems more responsive to the growth in tourist travel occurring. Current delays crossing the single-lane Albert Town bridge near Hawea could be an early warning of this.

Emerging or looming changes in mobility also pose a challenge. In Otago and Southland, our transport planning and responses are not adequately grappling with these changes and we are 'behind the eight ball' on such matters as technological advances (e.g. use of wayfinding technology using GPS and communications technology such as Bluetooth), new vehicle technologies - electric cycles and vehicles and, in time, driverless cars – or emerging demand for safe walking and cycling infrastructure and interconnected networks of medium to long distance walkways and cycleways.

The benefits of addressing this problem would be:

- improved network performance and capability and network resilience
- focus on areas of regional economic development, productivity and connectivity
- increased customer voice on connectivity, accessibility and mode shifts
- system optimised through communication technology, innovation and improved people capability
- greater value for money delivered by transport investments.

Problem 2: Attitudes and behaviour together with inconsistent quality of routes in the two regions results in fatal and serious injury crashes.

Each year, road trauma imposes a massive social cost on the Otago and Southland regions, equating to approximately 2 per cent of the GDP of each region. Statistical projection shows that unless we change how we behave on our roads, road crashes will continue to impose a collective social cost of between \$224M and \$332M each year in the two regions³⁸.

The level of fatal and serious injuries in Southland and Otago regions is shown in Table 10, and in Figure 4. Both are based on data from the Crash Analysis System (CAS) operated by NZTA (with data inputted by NZ Police). It is important to be aware that CAS is likely to be underestimating the quantum of serious injuries, and therefore the overall social cost of road trauma in Otago Southland, especially for incidents involving motorcyclists, pedestrian and cyclists.

Evidence of this type of under-reporting in Otago Southland comes from statistical analysis of CAS, hospitalisation and Accident Compensation Corporation (ACC) data for 2010-13 inclusive³⁹. The reporting rate of crashes in CAS over that period was estimated to be 26 per cent for motorcyclists, 43 per cent for pedestrians and 56 per cent for cyclists in Otago Southland⁴⁰

Region	Crash Year	Fatalities	Serious injuries	Minor injuries
Otago	2013	14	168	659
Otago	2014	19	168	650
Otago	2015	18	165	682
Otago	2016	20	195	708
Southland	2013	2	60	310
Southland	2014	12	56	290
Southland	2015	8	57	320
Southland	2016	16	83	316
Total	2013	16	228	969
Total	2014	31	224	940
Total	2015	24	222	1002
Total	2016	36	278	1024

Table 10: Fatalities and injuries, by year, in Otago and Southland regions, 2013-2016

Source: CAS data supplied by the Transport Agency, October 2017

³⁸ Based on statistical projections of crashes in the period 2010-13 (analysis available from Otago Regional Council). Note, road crashes (and their social cost) include both motorised and non-motorised incidents on the transport network. Examples of the non-motorised incidents include someone tripping on a footpath or roadway, or falling down the steps of a bus. Sometimes people refer to these types of incident as being an accident rather than a crash.
³⁹ Road safety in Otago and Southland regions: the top priorities for action. Jane Turnbull and Elle Flinn. Otago Regional Council

³⁹ Road safety in Otago and Southland regions: the top priorities for action. Jane Turnbull and Elle Flinn. Otago Regional Council 2015. Available from http://www.orc.govt.nz/Publications-and-Reports/Transport/Road-Safety-in-Otago/.

⁴⁰ ACC data indicates 717 claims were filed by clients who were riding a motorcycle at the time of their crash (on a public road in Otago or Southland), for crashes taking place between 1st January 2010 and 31st December 2012. Over the same period, CAS reports only 184 injury crashes involving a motorcyclist in the key-vehicle or second-vehicle position in Otago or Southland. Moreover, ACC data tells us that claims made by motorcyclists following a crash tend to result in higher payouts to the client than claims made by any other road-user group, suggesting that their injuries tend to be more severe and require more complicated medical procedures and a more extensive recovery period (ibid, page 17).



Figure 4: Road fatalities and serious injuries in Otago and Southland regions, 2002 to 2016, by quarter

Source: CAS data supplied by the Transport Agency, October 2017

This magnitude of social costs is clearly unacceptable both in economic terms and in terms of the effect on our communities. Any number is too many.

Two types of factor are likely to be largely responsible for the extent of road trauma in Otago Southland: (1) people's attitudes and behaviour, and (2) the nature of the land transport network itself.

The Safe Systems approach, which New Zealand is using to address road trauma, recognises the role that people's attitudes and behaviour have in causing this trauma. Although this has often been labelled as 'driver error', in recent years we have come to recognise that people make mistakes and some crashes are inevitable. Those managing the land transport system need to recognise that people are vulnerable because human bodies have a limited ability to withstand crash forces without being seriously injured or killed. Thus, those who design the road system and those who use the roads must all share responsibility for creating a road system where crash forces don't result in death or serious injury.

Research undertaken in 2016/17 for the Transport Agency by The Navigators, as part of research for the Southern Road Safety Influencing Group's pilot project, has revealed valuable insights into the perceptions of road risk that exist in the communities of Otago and Southland regions. Compared to the entire New Zealand population, people from Otago and Southland are more fatalistic (considering deaths to be unavoidable) and more likely to believe that enough is being done to reduce risk. The research showed that people's perceptions of road risks tend to focus on driver behaviour, yet their preferred solutions point to the road and its environment. This suggests that when residents are not satisfied that their roads are not safe to drive on, the best solution is not necessarily an engineering one. Better conversations are needed with the community about road risk and the benefits of speed limit reductions.

Speed is widely accepted as a problem, yet slowing down is a divisive solution. Compared to other regions, Otago and Southland residents are less likely to attribute serious crashes to travelling fast (60 per cent and 50 per cent) or careless driving (67 per cent and 63 per cent) but are more likely to highlight the risk associated with the road conditions, design or quality (38 per cent and 44 per cent). Those living in rural communities are more likely to rate roads (57 per cent and 67 per cent) as one of two top contributors to crashes⁴¹.

Attitudes towards speed, and how to manage the risk that speed poses, were further illustrated by the responses to research questions about speed limits. Compared to other NZ regions, those in Southland are more likely to oppose the reduction of speed limits (44 per cent oppose and 35 per cent agree); they are more likely to prefer that money is spent on improving the roads (71 per cent). In contrast, only 27 per cent in Otago oppose, and 49 per cent agree with, reducing speed limits on some roads in their area.

Variability in the quality of roads in Otago and Southland can be seen in the varying KiwiRap ratings for state highways in Otago and Southland and in the urban KiwiRap ratings for the two regions, the latter covering roading corridor and intersections⁴². The programme business case for SH1 also recognises the variable quality along SH1 between Christchurch and Dunedin⁴³. Variability in the quality of the road, along the route of major freight and tourism journeys can also be seen in the high-risk road mapping layer of NZTA's Safer Journeys assessment tool.

This Safer Journeys mapping layer shows that almost all of the (sections of) high risk roads in southern New Zealand are on the major freight and tourism routes shown in Figure 2: SH1, in particular, plus SH93 and parts of SH94, plus three roads around Invercargill. The same mapping tool shows the need to improve the safety of motorcycle touring routes.

For both Invercargill and Dunedin, urban KiwiRAP identifies a small number of corridors with a high collective safety risk level. In Dunedin's case, there are also a few intersections that pose this level of collective risk. There are several more corridors in Otago Southland with medium high and medium collective risk, mainly along the east coast, including in Dunedin, Invercargill and Balclutha, plus two in Central Otago.

The main benefit of addressing this problem would be to improve safety and reduce the social impact of fatalities and injuries.

Problem 3: Parts of the network are vulnerable to closure from adverse events resulting in economic and social disruptions, of which there is increased recognition.

Roads are vital to the everyday functioning of our communities. Yet, in Otago and Southland, we face major challenges just to maintain our current transport networks. Our demanding natural environment creates many challenges.

Growth can pose a challenge to network resilience. This challenge faces the Queenstown/ Wanaka/ Central Otago area. Growth can enable investment in resilient infrastructure, e.g. when investment projects provide additional redundancy in networks at the same time as providing for growth. When upgrading of infrastructure does not keep pace with growth however, this contributes to a reduction in infrastructure redundancy capacity and thus a

⁴¹ National quantitative research – better conversations on road risk. Southern Region Report Draft, August 2017. The Navigators. Powerpoint supplied to Southern Road Safety Influencing Group meeting.

⁴² For KiwiRap data, see: <u>http://www.kiwirap.org.nz/</u> and <u>https://roadsafetyrisk.co.nz/</u>.

⁴³ NZTA SH1 Christchurch – Dunedin programme business case. February 2017.

reduction in resilience. This has been evident in Queenstown especially when major events are being held.

Road closures due to natural events or road crashes also pose a challenge to resilience. At the same time, management of the transport system is struggling to keep up with changing expectations concerning how we deal with road closures and provide detours. When natural events or crashes result in road closures, detours may not exist (e.g. for the state highway between Bluff and Awarua), or they may be lengthy. There can be an additional issue when the detour is not particularly safe or has weight restrictions on it.

The way we are now living our lives 'just-in-time' has increased our vulnerability (compared to 20 or more years ago). For example, many businesses in Otago and Southland do not keep much stock but order it in when customers request. The pressure for same-day or next-day delivery, especially of retail goods, has introduced a risk to drivers attempting to use through-routes in winter conditions, particularly on SH8 over the Lindis Pass, and SH1 over Dunedin's northern motorway.

Lack of cell-phone coverage in many parts of Otago and Southland, coupled with adverse driving conditions, has the potential to delay advice about, and response to, crashes. Although there is radio-telephone coverage, cell-phone coverage is lacking on parts of several routes, including Clarksville to Roxburgh (SH8), the Lindis Pass (SH8), SH87, and SH94 between Te Anau and Milford Sound. Large parts of the Maniototo also lacks cell-phone coverage.

Those sections of the road network along the east coast of the South Island at higher elevations (including SH1 north between Dunedin and Waitati) are susceptible to periodic closure due to snow and ice in the winter months. Winter driving conditions continue to adversely affect inter-regional state highways, creating safety risks and leading to occasional road closure. Not just SH1, immediately north of Dunedin, but also the Te Anau-Milford Sound highway (SH94), Haast Pass/Tioripatea (SH6), Lindis Pass (SH8), the Pig Route (SH85), and SH87 between Outram and Kyeburn can become inaccessible for periods in winter. Significant parts of the local road network are also at higher altitudes, especially in Central Otago. These routes are also susceptible to closure in winter months, challenging the affordability of providing accessibility to large parts of the district, and over Danseys Pass⁴⁴.

Rockfall poses an ongoing problem in the Kawarau Gorge (SH6), at the Nevis Bluff, threatening access to Queenstown. Both rockfall and avalanches pose a risk at the eastern approaches to the Homer Tunnel on SH94 to Milford Sound.

Climate change poses another risk. Coastal areas are at risk from sediment movement and coastal erosion include the Katiki Straight in North Otago and the Oamaru rail yards. Over time, climate change may exacerbate this risk and resultant damage. The vulnerability of lower lying parts of the transport network to sea level rise (over the medium to long term), including much of South Dunedin, also requires further investigation and planning.

We face not only the challenge of trying to predict where rain and earthquake induced landslips are likely to occur, but also the potential challenges of (1) the high costs of remediating any large landslips and (2) the economic effects of prolonged closure. An example of the latter occurred when a slip at Diana Falls closed the Haast Pass in September 2013, initially for 11 days, disrupting the usual flows of visitors around the South

⁴⁴ See Central Otago District Council Activity Management Plan.

Island. NZTA subsequently opened one lane but it took more than 14 months' remedial work to stabilise the site and reinstate two lanes⁴⁵.

The Christchurch earthquakes in 2011, the Kaikoura earthquake in 2017, on top of the severe rain and snow events in recent years, have raised the question in many people's minds of whether the South Island is sufficiently resilient to disruptions to our land transport system. These events have stimulated discussions about how we can increase our resilience.

Thanks to recent scientific research, we now know the Alpine Fault, which runs 400 km up the South Island, poses a large risk to many southern South Island communities. Historical patterns of earthquake activity suggest that this fault is likely to rupture sometime in the next few decades, with devastating consequences. In the scenario modelled for the Alpine Fault Study Project AF8, which has an expected return period of 300 years, tens of thousands of landslides are expected, isolating many areas by road, including Queenstown, Wanaka and surrounding settlements, and damaging most if not all lifelines. These growth areas remain geographically distant from their major sources of food and fuel, and are totally dependent on trucked fuel.

The main benefits of addressing this problem would be:

- improved network performance and capability, and network resilience
- improved safety and reduced social impact of fatalities and injuries
- focus on areas of regional economic development, productivity and connectivity
- system optimised through communication technology, innovation and improved people capability
- greater value for money delivered by transport investments.

Problems on the regions' state highways

The NZTA has prepared a draft state highway investment proposal, which identifies the key problems for the state highway corridors within, and connecting with, the Otago and Southland regions, as set out below. These problems mainly concern safety, but also accessibility, connectivity, resilience and regional development.

Wanaka to Nelson (SH6)

- This route has safety hotspots: run-off road, head-on, mix of traffic.
- This is a tourist route and many drivers on it are unfamiliar with the route.

Queenstown to Rangitata (Christchurch (SH8)

- This route has safety hotspots: run-off road, head-on, mix of traffic.
- This is a high-volume tourist route and many drivers on it are unfamiliar with the route.

Cromwell to Milton (SH8)

- This is the main tourist link between Dunedin and Central Otago/Queenstown Lakes.
- Increasing traffic volumes from tourists and recreational travellers and infrequent/substandard passing opportunities.
- There are isolated resilience issues.

⁴⁵ See: <u>https://www.nzta.govt.nz/planning-and-investment/2015-18-national-land-transport-programme/case-studies/diana-falls/</u>. Accessed 15 September 2017.

Queenstown to Milford Sound (SH6, SH97, SH94)

- There is a safety risk due to challenging and unforgiving terrain and a large portion of first time route users (Otago section i.e. Devils Staircase)
- Development between Frankton and Jacks Point is likely to result in an additional 8,000-10,000 daily trips which has the potential to affect speeds/efficiency of the northern section of SH6.
- There is a safety risk due to challenging and unforgiving terrain and a large portion of first time route users
- Resilience issues relating to natural hazards (rockfall, avalanche), weather, incident and preventative maintenance events
- There is no alternate route and limited communications (e.g. cell reception).

Dunedin to Christchurch (SH1, key local routes, and the Main South Line (rail)

- Travel time is unreliable: increasing traffic, mix of traffic with speed differentials and peak event demands.
- There are safety hotspots: intersections, run-off road, head-on and unforgiving environment.

Port Chalmers to Bluff (SH88, SH1)

- This is the main economic enabler for the region, connecting Dunedin and Invercargill, industry and ports.
- SH88 from Ravensbourne to Port Chalmers is narrow, windy and lacks adequate shoulders over a significant portion of its length for a national route.
- Accessibility issues for HCVs, particularly the SH88/SH1 intersection and the Sawyers Bay overbridge.
- Accessibility issue for HCVs at SH1/SH93 intersection.
- Identified safety issues include SH93 between Clinton and Mataura, which is only twostar rated, with challenging topography and sub-standard passing opportunities.
- Industrial development pressures south of Invercargill.

Southern Cluster, Otago (SH85, SH87, SH90)

- These provide connectivity and links into Central Otago from Dunedin/Mosgiel.
- SH87 is affected by snow and both are susceptible to ice/winter driving conditions.
- Current and projected population growth in Mosgiel is having an impact on the transport network and the town centre, particularly in afternoon peak.

Southern Cluster, Southland (SH6, SH90, SH94, SH96, SH98, SH99)

- These provide important connectivity with local roads for visitors, local communities and freight movement.
- SH99 forms part of the Southern Scenic Route, an important and popular tourist route. Visitor expectations of a consistent and reliable journey experience on both state highways and local roads e.g. consistent signage and road conditions.
- The focus is on maintaining connectivity through maintenance and operations and event response planning to facilitate reliable and efficient access for freight.