

Appendix 'H'

Future Demands and Trends and Future New Capital Requirements

Appendix 'H' includes:

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1. Types of New Capital Work

New capital expenditure is:

"Expenditure that is used to create new assets or to increase the capacity of existing assets beyond their original design capacity or service potential.

New capital expenditure increases the value of asset stock¹."

The most common forms of land transport new capital expenditure, in the Southland situation, are identified in Attachment 'A'.

2. Forecast Future Demand

The notes in Attachment 'B' identify the main factors that are expected to influence the demand for land transport new capital expenditure in Southland during the next ten years.

3. The Likely Implications of the Forecast Future Demand and Other Matters that Need to be Taken Into Account When Formulating the Future Management Approach

The notes in Attachment 'C' explain what the implications of the forecasted demand (as it has been identified in Attachment 'A') are likely to be, and what the matters are that the Council will need to take into account when formulating its future approach for addressing them.

4. The Future New Capital Development Approach

After having considered all of the matters discussed in Attachments 'A' – 'C', the Council's adopted approach for the selection and programming of future new capital works is:

- a) To evaluate all of the identified desired works by way of a benefit/cost process.

This involves an analysis of:

- i) Benefits to the road users for reducing delays in the time to travel along a given route;
- ii) Vehicle operating savings;
- iii) Safety benefits;
- iv) Maintenance cost savings; and

¹ Reference: The International Asset Management Manual.

- v) The intangible benefits, including community dislocation, environmental issues (including noise and vibration) and other local, regional and national factors

That will potentially result from the proposed work; and

- b) To only undertake those projects for which subsidy from NZTA can be obtained (although this policy may occasionally be varied when there is considered to be a community benefit over and above that identified by the benefit: cost analyses – and NZTA does not subsidise some categories of work, eg footpaths).

5. The Proposed Future New Capital Works Programme

As a result of the above process, the Council's proposed future, new capital development programme is as shown in Table H.1.a. This includes the new capital portion of renewals discussed in Appendix F. It does not include vested assets.

Table H.1.a Proposed New Capital Development Programme (\$'000) – 2009/19

2007/08 Actual	2008/09 Approved	Work Category No	New Capital Requirements	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19
306	344	211	Unsealed road metalling	299	299	299	299	299	299	299	299	299	299
62	70	213	Drainage New Capital	75	75	75	75	75	75	75	75	75	75
3	0	222	Traffic services New Capital	57	57	57	57	57	57	57	57	57	57
604	600	231	Associated improvements	620	645	670	694	719	744	769	794	818	843
21	62	322	Bridge New Capital	55	55	55	55	55	55	55	55	55	55
0	0	325	Seal extension	100	100	100	100	100	100	100	100	100	100
934	1,009	341	Minor improvements	1,027	1,027	1,027	1,027	1,027	1,027	1,027	1,027	1,027	1,027
0	0	451	Pedestrian Facilities	0	0	50	50	50	50	50	50	50	50
0	0	452	Cycle Facilities	0	0	50	50	50	50	50	50	50	50
0	0												
1,930	2,085		TOTALS	2,233	2,258	2,383	2,407	2,432	2,457	2,482	2,507	2,531	2,556
			Inflation Allowances	0	65	140	203	266	328	396	470	547	621
			Total New Capital (incl inflation)	2,233	2,323	2,523	2,610	2,698	2,785	2,878	2,977	3,078	3,177

Refer to Appendix F for Notes and Assumptions regarding these figures.

Associated Improvements are taken to be 100% New Capital.

The budget of \$100,000pa for seal extensions is an allowance to fund the growth costs of upgrading roads which become inadequate due to the development of a subdivision or other large traffic generator along a road which previously served far less traffic. At the time that any of this work is carried out, any available development contribution money will be added to this budget to enable work to proceed.

Table H.1.b Proposed Roothing Related Urban Works New Capital Development Programme (\$1,000) – 2009/19

New Capital Projects	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19
Footpaths										
BALFOUR	37	0	0	0	0	0	0	0	0	0
COLAC BAY	18	0	0	0	0	0	0	0	0	0
EDENDALE	15	0	0	0	0	0	0	0	0	0
MANAPOURI	250	0	0	0	0	0	0	0	0	0
STEWART ISLAND	10	10	10	0	0	0	0	0	0	0
TE ANAU	70	0	0	0	0	0	0	0	0	0
THORNBURY	6	0	0	0	0	0	0	0	0	0
WALLACETOWN	40	0	40	0	40	0	40	0	40	0
WOODLANDS	7	0	0	0	0	0	0	0	0	0
Kerb and Channel										
MANAPOURI	250	0	0	0	0	0	0	0	0	0
NIGHTCAPS	0	0	50	0	10	0	0	0	0	10
TUATAPERE	3	3	3	3	3	3	3	3	3	3
WALLACETOWN	0	0	50	0	0	50	0	0	50	0
WINTON	5	5	5	5	5	5	5	5	5	5
Street Lights										
RIVERTON	1	1	1	1	1	1	1	1	1	1
STEWART ISLAND	12	0	8	0	0	0	0	0	0	0
TE ANAU	10	10	0	0	0	0	0	0	0	0
Totals excluding inflation	733	28	166	8	58	58	48	8	98	18

Note:

- Full long term Urban Works programme incomplete at this stage.
- Table includes inflation.
- Manapouri – Upgrade View Street – this is treated as a vested asset as the Roothing Programme is only making a small contribution to the overall project cost.

All of the works listed in the above tables are considered to be necessary as a result of the demand for either changes to the asset to reflect good Asset Management Practices or increased level of service – except the following projects, which are necessary (to the extent shown) because of projected increased growth.

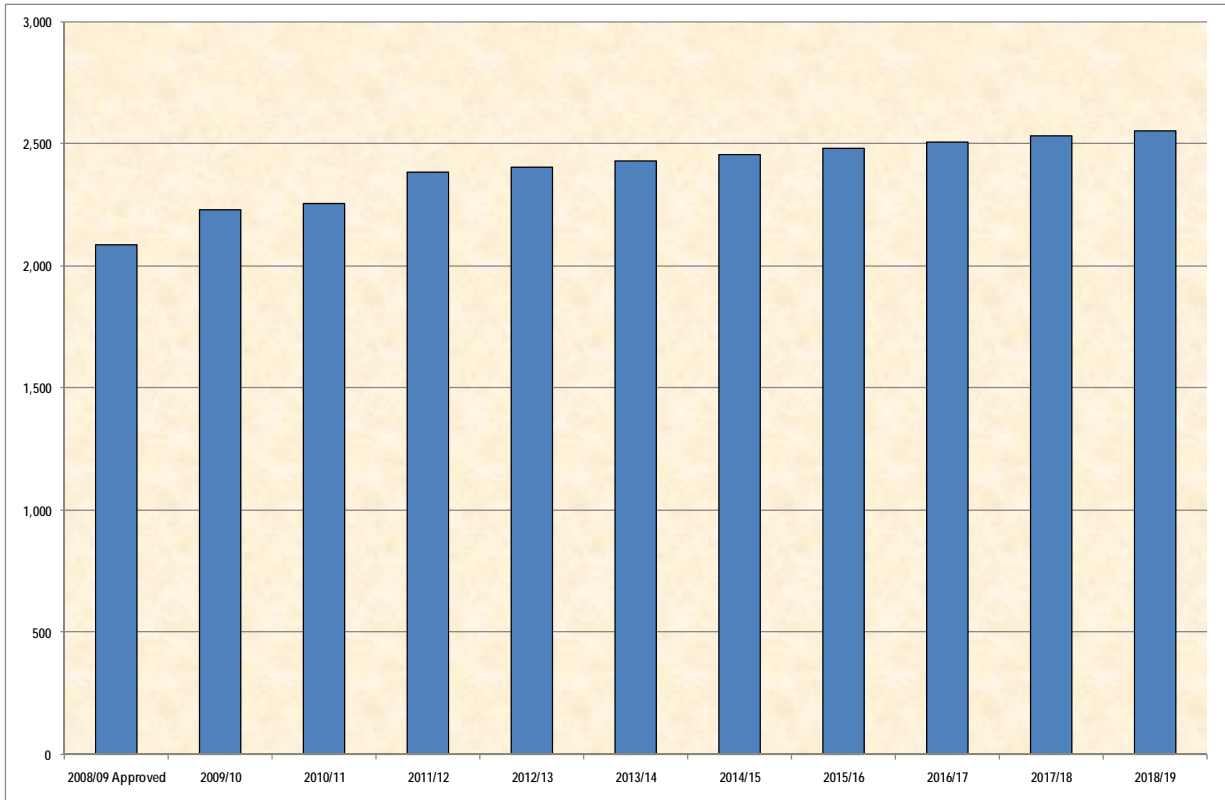
Table H.2 Growth Costs

Subdivision Description	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19
Edendale Bridge Trust	\$50,000									
Vantage Investments	\$270,000									
Totals	\$320,000									

These costs are mainly seal extension costs required to enhance the connection of a new subdivision to the existing roading network. Because of the uncertainty associated with when this work will be required (due to timing issues surrounding the developments and when housing construction will lead to sufficient growth in traffic to warrant the work), a decision has been made to only programme to carry out 75% of the above work.

Funding of these growth costs will be through a combination of development contributions, rates and subsidies. The development contributions will be used to fund the maximum amount payable under current legislation.

Table H.3 Estimated New Capital Requirements – 2009/19



Notes:

- Excludes footpaths.
- Excludes inflation.

6. Issues

- Full programme of Urban Works including Footpath Renewals and New Footpaths needs to be developed.
- Continue to monitor heavy vehicle growth and report on regularly.

7. Future Action and Improvements

Schedule Future Improvement Priorities

Ref. No. (1)	Item (2)	Appendix Relative Urgency (3)						Comments
		1	2	3	4	5	6	
H1	Full programme of Urban Works including Footpath Renewals and New Footpaths needs to be developed					✓		This item is now covered by F18.
H2	Continue to monitor heavy vehicle growth and report on regularly					✓		To develop reports.

Key:

- 1 = Extremely urgent (needs to be addressed now)
- 2 = Very urgent
- 3 = Urgent
- 4 = Reasonably or fairly urgent
- 5 = Not urgent
- 6 = A good idea for some time in the future

Attachment 'A'

The Most Common Forms of Land Transport New Capital Expenditure in the Southland Situation

New land transport assets are normally created in three ways:

- a) By the construction of new roads, kerb and channel, footpaths, street lights, active transport facilities and so forth, and their vesting in the Council, by property subdividers;
- b) By new bridge structures created by property owners as a part of the creation of stock crossings; and
- c) By work carried out by the Council

Typically, the expenditure falls under the following headings:

Sealed Roads

Construction work that increases the capacity of the road.

- i) Seal Widening
- ii) Minor Safety Projects (including isolated geometric improvements, intersection improvements, traffic calming measures, lighting improvements, the provision of guard rails, sight benching to improve visibility, pedestrian crossings, stock underpasses, safety footpaths, seal widening, isolated seal extensions to improve safety (eg steep hills / bridge approaches)
- iii) Clear Zone adoption

Gravel Roads

- i) Construction work that increases the capacity of the road
- ii) Seal Extensions
- iii) Road Widening
- iv) Minor Safety Projects
- v) Traffic Calming Works

Bridges

- i) New Bridges which are either totally new or replace an existing bridge to a higher standard such as higher loading carry capacity or two lane instead of single lane

Drainage

- i) Extensions to existing drainage facilities
- ii) Upgrading to improve the level of service
- iii) Safety improvements

Footpaths

- i) New Footpaths
- ii) Upgrading work to improve the level of service
- iii) Safety Footpaths

Traffic Services

- i) Signs
- ii) Pavement Markings
- iii) Route Delineation Markers

Street lighting

- i) New Street Lights

Active Transport Facilities

- i) New Cycleways
- ii) Cycle Lanes

Attachment 'B'

The Main Factors Likely to Influence the Demand for Land Transport New
Capital Expenditure During the Next Ten Years

1. Introduction

The key demand issues for the future are:

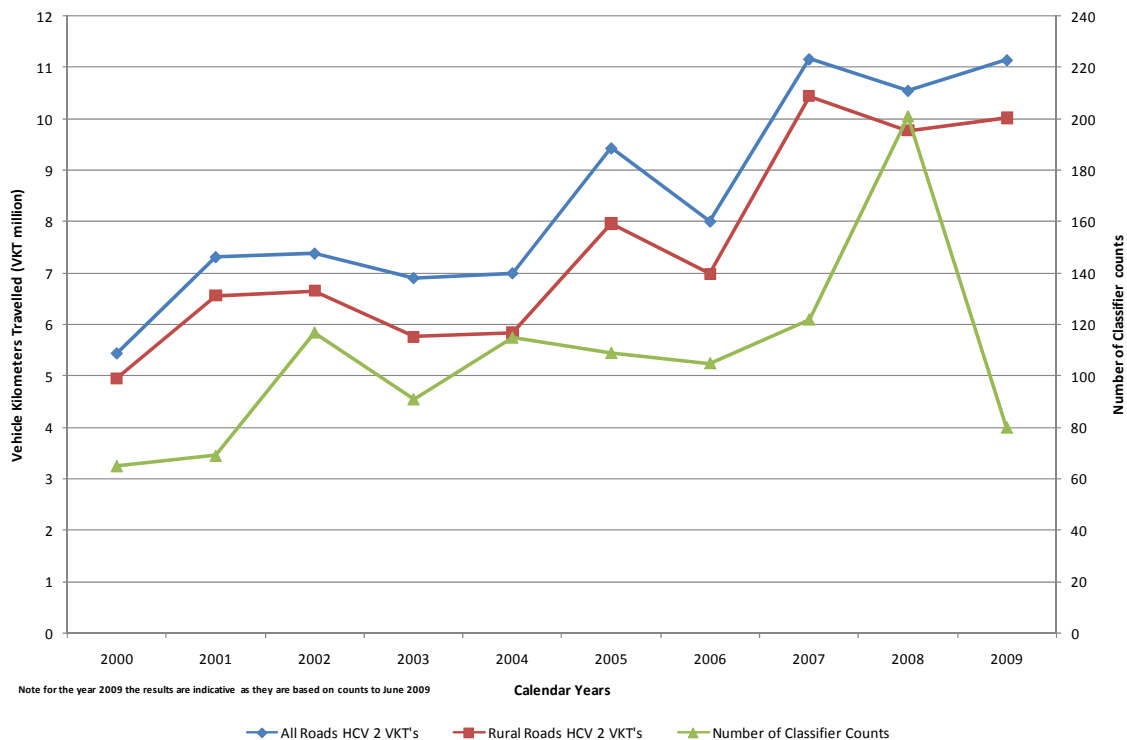
- a) Population Trends.
- b) Forestry Harvesting.
- c) The Growth in Dairying.
- d) Tourism.
- e) The Constant Demand for a Higher Level of Service (or for faster response to maintenance and renewal issues).
- f) The demands placed on Council by the GPS, particularly in relation to Active Transport.
- g) Other.

Each of these issues is discussed separately, next.

Overall heavy vehicle travel has increased significantly on the network over the past 8 years.

This is demonstrated by the increase of Heavy Commercial Vehicle 2 (HCV2) shown in Figure H.B.0. HCV2's cover truck and trailer units with 5 or more axles.

H.B.0 Southland District Council HCV2 Vehicle Kilometres Travelled



2. Population Trends

The historical population trends are:

- | | | |
|----|-------------|-------------------------------|
| a) | 1981 – 1991 | A decrease of 2,658 (or 8.1%) |
| b) | 1991 – 1996 | A decrease of 141 (or 0.5%) |
| c) | 1996 – 2001 | A decrease of 1,845 (or 6.0%) |
| d) | 2001 – 2006 | A decrease of 273 (or 1.0%) |

However, this declining trend is forecasted to being halted and the total population is forecast to rise from 93,200 in 2006 to at least 98,700 in 2016.

A further decline in some of the rural areas may occur as a result of property amalgamations. This is expected to be offset by the upsurge in demand for coastal and lakeside properties – particularly in Riverton, Manapouri and Te Anau – and from rural subdivisions close to the more popular townships (eg Winton).

3. Forestry Harvesting

Figures H.B.1 and H.B.2 show the age profile of planted production forest area in the Southland District Council. The bulk of this is radiata pine with an average harvest age of 27 years. The mix of eucalyptus with a harvest age of 15 years and Douglas fir with a harvest age of 50 years will balance and be similar to radiata pine. The Southland planted production forest area has a relatively young age profile due the significant number of plantings in the last 15 years. Approximately 20.3% of Southland plantings are in the 16 to 30 year age classes.

Production will remain relatively constant over the next 10 years but then harvest volumes will be dramatically increased within 15 years. It is predicted that the significant increase in harvesting will commence from 2016 to 2020 therefore Southland District Council should start planning for the increase in heavy vehicle movements on their network and the associated upgrades that may be required. An investigation into the routes that will be affected is required.

The increase in wood availability will come primarily from small-scale forest growers who established forests in the 1990's. The dispersed and fragmented nature of this forest resource will have an impact on transport infrastructure as timing for the harvest will rely on market conditions and the small-scale owner's management of their plantings.

Figure H.B.1 Southland Forest Age Profile as at April 2004²

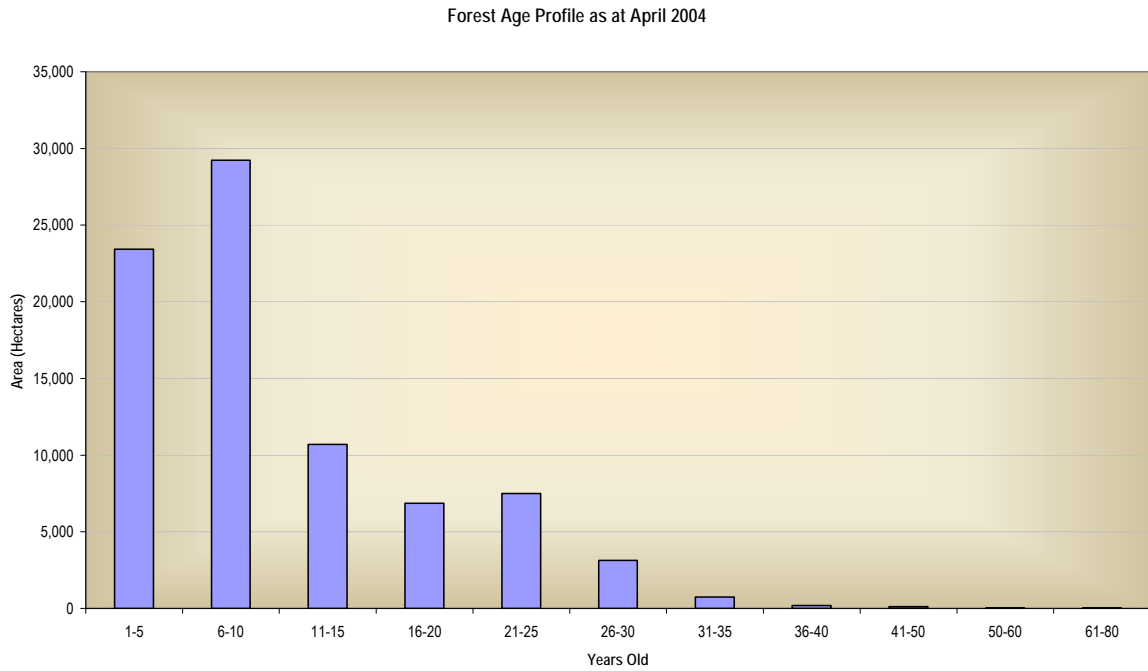
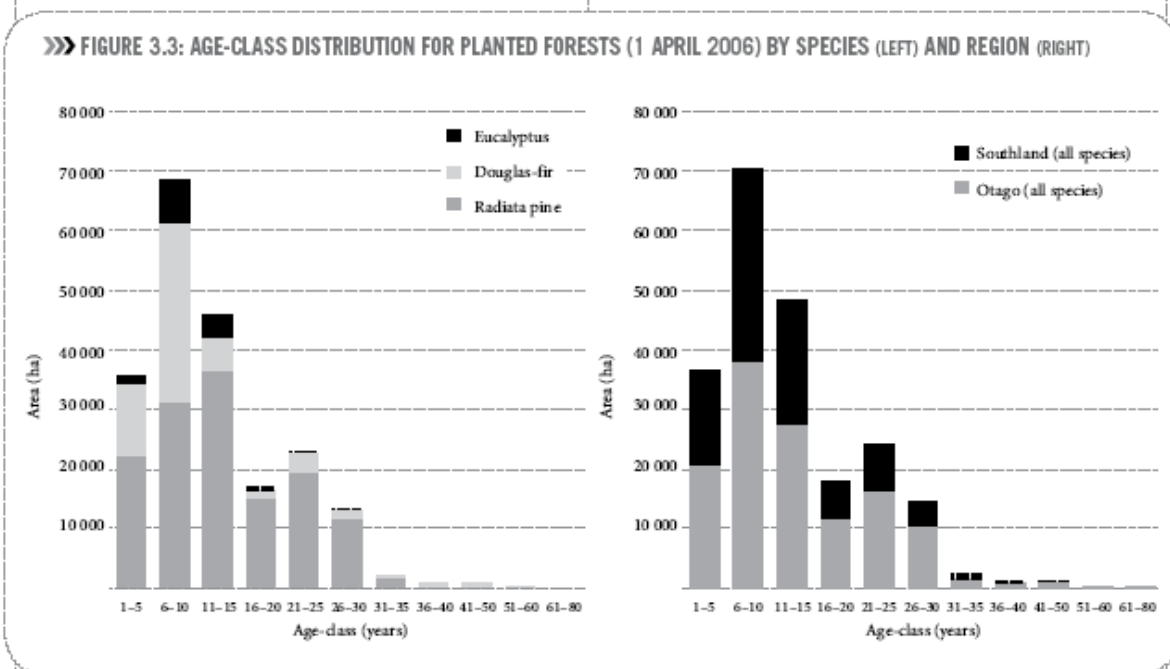


Figure H.B.2 Otago Southland Age Distribution Profile as at April 2006³



² Ministry of Agriculture and Forestry, National Exotic Forest Description

³ Ministry of Agriculture and Forestry, Otago / Southland Forest Industry and Wood Availability Forecasts, April 2008

4. The Growth in Dairying

There are several factors that can (perhaps significantly) impact on dairy growth, viz:

- a) New farm conversions were controlled by the Fonterra, so they can ensure there is sufficient processing capacity, but have to date responded by expanding to meet the demand. There are now two other smaller players in the market which will encourage more conversions.
- b) There will be growth from increases in productivity from maturing farms and improved management.
- c) There are seasonal variations that depend on the climate.
- d) The value of the New Zealand dollar.
- e) The relative returns obtained from other types of farming.
- f) Environmental factors regarding Southland's ability to sustain substantial further increases in dairying both from a water supply and effluent disposal point of view.

Southland has been identified by MAF as being one of the favoured areas for investment in new dairy farms, with 28 new dairy conversions starting in 2007/2008 and an additional 15 dairy sheds. The Southland Demographic projections indicate that the amount of land used for dairy farming is projected to rise from about 120,000 hectares in 2007 to 260,000 hectares in 2031 due to the ongoing conversion of sheep farms to dairy. The number of dairy conversions is estimated to be 100 per annum until 2013, 20 per annum until 2018, 10 per annum until 2023 and five per annum for the rest of the forecast period. Conversions are expected to average 175ha each with herds of between 500 and 600 cows.

In 2006 the 'best projections' we had are shown in Table H.B.1. The Butcher Report forecasts a 7% per annum rise in milk production volumes over the next 10 years.

Table H.B.1 Predicted Milk Production⁴

Year 30 June	kg Milk Fats (Millions)
2006	113
2007	121
2008	130
2009	138
2010	148
2011	158
2012	170
2013	181
2014	194
2015	208
2016	222

It is understood that Fonterra is predicting dairy tanker traffic in the region will increase to 15 million vehicle kilometres per year by 2011 a growth of over 2 million vehicle kilometres each year (gross) over the next 3 years. (This is yet to be confirmed by Fonterra and may be reduced by the global financial crisis and the drop in milk payout from its record levels).

⁴ SDC Corporate Assumptions

5. Tourism

Tourism in the District is increasing, with travel by rental cars and camper vans being popular – particularly on the Southern Scenic Route and on adjacent roads. Estimates put the value of tourism expenditure in the Southland Region in 2005 at \$261 million, with expenditure expected to increase by 36% to \$409 million in 2013. Table H.B.2 shows the expected trends in Total Spend (\$M).

Table H.B.2 Projected Total Tourism Expenditure Growth Trends in Southland and Fiordland

Year	International Expenditure (\$M)	Domestic Expenditure (\$M)	Total Expenditure (\$M)
2005	111	150	261
2006	127	177	205
2007	130	181	311
2008	139	188	327
2009	150	192	342
2010	161	197	358
2011	178	201	379
2012	186	206	392
2013	198	211	409
Annual Change	6.5%	3.1%	4.3%

The projected number of visits to the two Regional Tourism Organisation (RTO) regions, i.e. Southland and Fiordland, are shown in Table H.B.3.

Growth in the number of domestic visits to Southland RTO will be partly driven by economic expansion of the region as a sizeable proportion of visits are business related. Both Southland and Fiordland RTOs will benefit from the expected increase in international visitors to New Zealand.

Table H.B.3 Number and growth of visits to New Zealand and Southland, 2001-2031 (Actual figures to 2006)

	New Zealand		Southland		Fiordland	
	Domestic	International	Domestic	International	Domestic	International
<i>Number of visits (1000)</i>						
2001	75,871	9,787	1,440	96	208	481
2006	61,021	15,261	1,259	214	144	807
2011	63,826	18,729	1,290	263	146	983
2016	65,044	21,161	1,321	292	146	1,102
2021	65,664	23,456	1,366	318	144	1,215
2026	66,291	26,000	1,412	346	143	1,340
2031	66,923	28,821	1,459	376	141	1,479
<i>Average annual growth</i>						
2001-2006	-4.3%	9.3%	-2.6%	17.4%	-7.0%	10.9%
2006-2011	0.9%	4.2%	0.5%	4.2%	0.3%	4.0%
2011-2016	0.4%	2.5%	0.5%	2.1%	-0.1%	2.3%
2016-2021	0.2%	2.1%	0.7%	1.7%	-0.2%	2.0%
2021-2026	0.2%	2.1%	0.7%	1.7%	-0.2%	2.0%
2026-2031	0.2%	2.1%	0.7%	1.7%	-0.2%	2.0%

Source: Ministry of Tourism and Infometrics estimates

6. The Constant Demand for Increased Levels of Service (or for faster response to maintenance and renewal issues)

The continuous demands for increased levels of service (and for faster response to maintenance and renewal issues) include:

- a) The demand for sealing the gravel roads (and / or for maintaining them in a better condition);
- b) The elimination of weight and speed restrictions on bridges;
- c) The need to widen certain roads (especially those associated with heavy vehicle use);
- d) An increasing focus on road safety; and
- e) The predicted rate of deterioration of the road pavements is faster than the Council's ability (within its current funding limits) to be able to respond.

7. Active Transport Expectations

Active Transport, walking and cycling, is to be encouraged under the Government Policy Statement (GPS). This is aimed at achieving environmental and health benefits and is covered in detail in Appendix F, Attachment M.

8. 'Other' Demand Related Issues

Other demand issues that can influence the way in which the Council needs to manage the network include:

- a) The increase in the number of heavy vehicles from farming intensification;
- b) Changes in land use types and practices;
- c) Changes in industrial activity, i.e. mining, energy;
- d) Metal smelting opportunities;
- e) Rapid subdivision and the development of coastal and lakeside properties;
- f) The potential implementation of a programme of designating heavy vehicle "50T" routes; and
- g) Changes in the vehicle fleet (see Table H.B.4).

Table H.B.4 Illustrating How Changes Over Recent Times of the Vehicle Fleet in New Zealand Has Affected the Way the Road Network Has to be Managed

Vehicle Type	Cause	Effect
Trucks	Increased power to trucks.	This leads to greater potential damage on steep hills and intersections as trucks change gear and accelerate and decelerate.
	The improvements to power steering.	This leads to greater damage with turning vehicles at intersections and entering and leaving the roadway.
	Larger trucks.	Wider intersections and corners are required to accommodate increasing turning circles.
Cars	The predominance of Japanese cars.	There are also trends for thinner sheets on the car body, which are more prone to damage from loose metal and lower chassis requiring unsealed roads to be graded more frequently. With these changes, road users now expect a higher standard of road with fewer changes in standards.
	The increasing amount of cars with power steering affecting sealed surfaces.	This affects the type of surfaces required where high surface torsion can be expected (eg intersections, corners and parking areas).

9. Planning for the Future

The following section incorporates the overall SDC Corporate assumptions for the District as a whole regarding future trends, which provide further background.

9.1 Drivers for Demand⁵

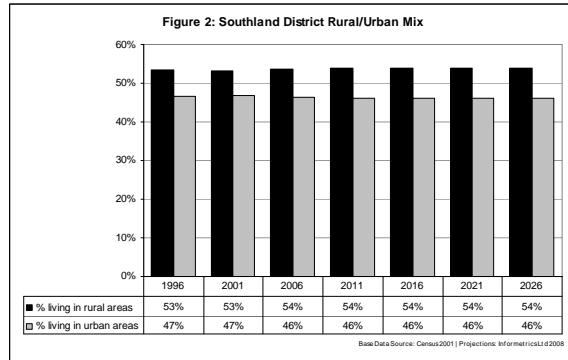
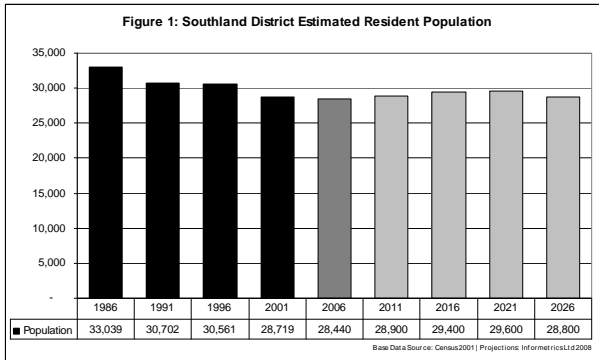
The future demand for services in the Southland District will be driven by⁵:

9.1.1 Population

The District's population is expected to grow slightly (1.6%) from 28,440 in 2006 to 28,800 in 2026. (Figure 1)

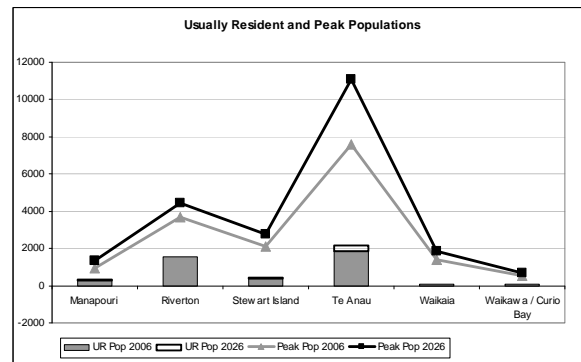
Since 2006, development of coastal areas of Southland and areas close to Southland lakes and national park areas has slowed. Instead there has been an increase in the development of rural land, particularly for activities associated with dairy farming. As a result of the increase in dairy farming, population growth is expected to be more evenly spread throughout communities and areas in the District. Previous predications that people would move from living in "rural" areas to "urban" settings are no longer expected with around 54% of the population expected to continue to live in rural areas through until 2026, and 46% living in urban areas. (Figure 2)

⁵ Information used in this section is summarised from the Southland District Council Community and Economic Growth Assumption Study 2008



9.1.2 Peak Population

Southland has a number of communities (Stewart Island, Te Anau, Riverton, Manapouri, Waikaia and Waikawa/Curio Bay) which have higher peak populations at certain times of the year. These areas are generally those with second home owners and visitors which may not be reflected in the usually resident population counts. Estimates of the peak population for these are shown in Figure 5 and in the Table H.B.5 below.

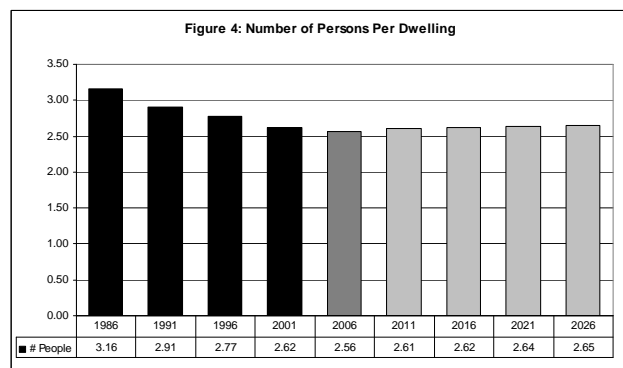
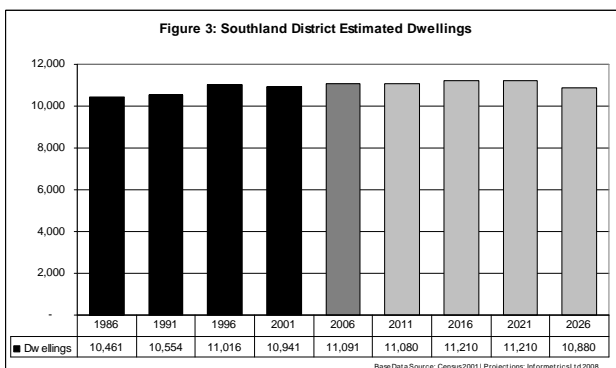


H.B.5: Estimated Peak Population of Selected Communities

Township	2006	2011	2016	2021	2026	2031
Manapouri	940	1,073	1,162	1,246	1,329	1,420
Riverton	3,664	4,122	4,232	4,350	4,443	4,542
Stewart Island	2,115	2,483	2,568	2,668	2,757	2,849
Te Anau	7,584	8,779	9,638	10,354	11,078	11,880
Waikaia	1,378	1,655	1,715	1,786	1,860	1,927
Waikawa / Curio Bay	523	618	643	667	682	707

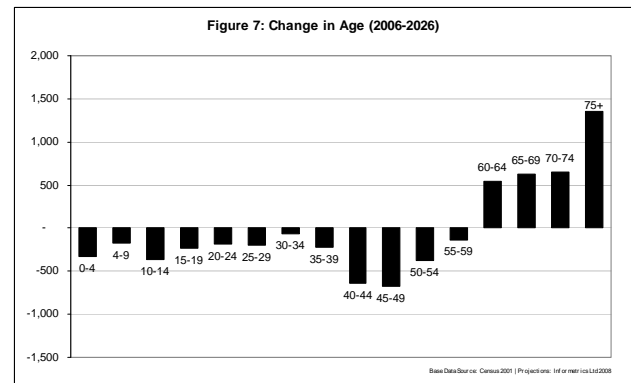
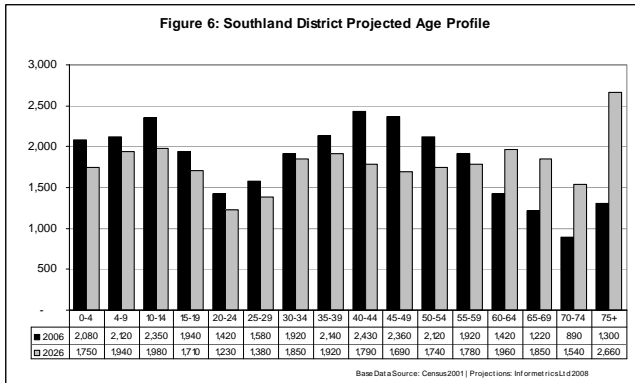
9.1.3 Dwellings

The number of dwellings is expected to increase slightly over the next ten years however in a longer perspective a slight decrease from 11,091 in 2006 to 10,880 in 2026 is expected (Figure 3). The number of persons per dwelling will slightly increase over the next years (Figure 4).



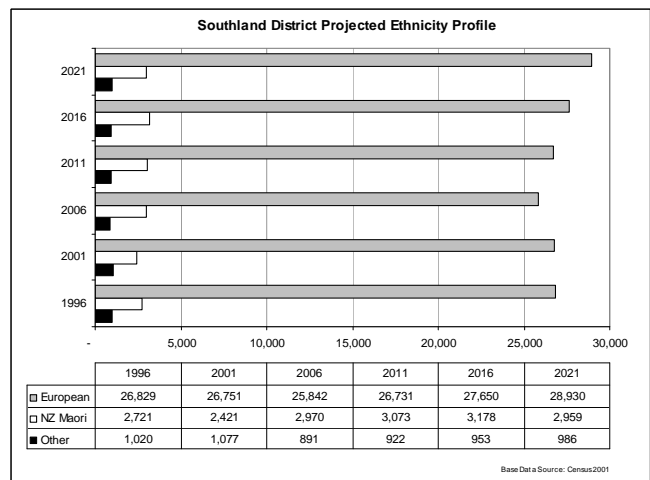
9.1.4 Age Profile

The proportion of the population that are aged 65 years and above is expected to increase over the next twenty years from 12% in 2006 to 21% in 2026 (see Figures 6 and 7).



9.1.5 Ethnicity

In 2006, 79.4% of the population of the Southland District identified themselves as being of European descent. 9.4% identified themselves as belonging to the Māori ethnic group NZ Maori with 1.1% as Asian, 0.6% as Pacific Peoples, 0.2% as Middle Eastern/Latin American/African and 17% as Other (New Zealander). With the baseline scenario including projections of attracting migrants to the region (particularly for dairying), it is expected that there will be a slight increase in the number of residents of Asian⁶ descent.



9.1.6 Industry⁷

Dairy Industry - The total production of milksolids could increase by over 100 million kg per annum, from 99 m/kg in 2004, to 208 m/kg in 2015. Over the same period, the number of dairy cows could increase from 250,000 to 400,000. By the year 2020, there could be as many as 500,000 dairy cows in the district, producing over 290 m/kg of product per annum.

Forestry and Logging - The amount of timber harvested in the district is predicted to remain relatively constant over the period of the Plan, but there will be a spike in production between 2012 and 2020.

Projections of future land use in Southland are shown in Table H.B.6⁸. The amount of land used for dairy farming is projected to rise from about 120,000 hectares in 2007 to 260,000 hectares in 2031 due to the ongoing conversion of sheep farms to dairy. The number of dairy conversions is estimated to be 100 per annum until 2013, 20 per annum until 2018, 10 per annum until 2023 and five per annum for the rest of the

⁶ 'Asian' as defined by Statistics NZ includes: South East Asian (Filipino, Burmese, Vietnamese, Indonesian etc), Chinese, Indian, Other Asian (Sri Lankan, Tibetan, Afghani, Bangladeshi, Pakistani, etc)

⁷ Source: Butcher Report 2004

⁸ The estimates of land use for 2007 draw heavily on Geoff Butcher's estimates presented in the study *Potential changes in primary production and employment in Southland Region 2004-2020*. Where appropriate the estimates for 2007 also draw on the 2007 Agricultural Production Census from Statistics New Zealand. However, Butcher offers a more useful disaggregation of total land use than that provided in the Agricultural Production Survey.

forecast period. Conversions are expected to average 175ha each with herds of between 500 and 600 cows. There is evidence some that non-dairy land is being used for runoff, feed lots and supplementary feed production for dairy but we have not tried to quantify it for this exercise.

The amount of land used for forestry is projected to decrease slightly in line with estimates from the 2007 Deforestation Survey⁹. While most high country and marginal lands are likely to stay under forest, some areas of flat land and Eucalypt forest are expected to be converted to dairy following harvesting. Total land utilised for forestry is projected to decline from 87,000 hectares in 2007 to 86,200 hectares in 2031.

The growth in dairy farm land will occur largely at the expense of sheep and beef farming land. Sheep farming land is projected to decrease from about 794,000 hectares to 673,000 hectares and beef farming land from 95,000 hectares to 78,000 hectares. Deer farming land is expected to remain constant up to 2031.

Table H.B.6: Southland Land use: 2007 to 2031 (1,000 ha)

	2007	2011	2016	2021	2026	2031
Forestry	87.4	87.2	87.0	86.7	86.5	86.2
Arable	8.4	8.4	8.4	8.4	8.4	8.4
Dairy	119.8	190.9	236.4	248.6	254.7	259.1
Deer	45.1	45.1	45.1	45.1	45.1	45.1
Beef	94.8	91.8	88.2	84.7	81.4	78.2
Sheep	793.9	726.0	684.4	675.8	673.3	672.4
Total	1149.4	1149.4	1149.4	1149.4	1149.4	1149.4

Source: Butcher Partners, Statistics New Zealand and Infometrics estimates

Tourism – The number of tourism visits to Southland is expected to increase from around 2.4 million in 2006, to 3.2 million in 2026. A significant portion of these visits are expected to be to Fiordland (with 950,000 visits in 2006 increasing to 1.5 million in 2026). The number of annual visits to the region is expected to increase from around 1.47 million in 2006, to 1.57 million in 2013 and the number of total visitor nights from 1.35 to 1.52 million over the same period. Fiordland will benefit greatly, with total visitor nights set to increase from 857,700 in 2006, to 1.04 million in 2013.

9.1.7 Southland's Communities

In 2006, just over half (54%) of the population lived in a rural environment, while the balance lived in an urban setting in one of the District's 28 communities. The populations of these towns range from less than 60 in Fortrose to 2,310 in Winton.

Since 2006, development of coastal areas of Southland and areas close to Southland lakes and national park areas has slowed. Instead there has been an increase in the development of rural land, particularly for activities associated with dairy farming. As a result of the increase in dairy farming, population growth is expected to be more evenly spread throughout communities and areas in the District. Previous predications that people would move from living in "rural" areas to "urban" settings are no longer expected with around 54% of the population expected to continue to live in rural areas through until 2026, and 46% living in urban areas. (Figure 2)

The change in population of Southland communities is not expected to be even across the District over the next ten years, with some areas increasing in population, and others declining.

⁹ The 2007 Deforestation Survey () estimates that about 1000 ha of land will be deforested between 2008 and 2020. The survey was carried out after the announcement of the Emission Trading Scheme and the estimates of deforestation assume the scheme goes ahead.

The following tables (H.B.7 and H.B.8) show estimated population and dwellings for the various communities in the District until 2026. Townships where a significant level of population growth is projected include Te Anau, Winton, Manapouri, and Edendale (though the latter is forecast to tail off). Significant population decline is projected for Lumsden, Woodlands, Ohai and Nightcaps.

Other townships are likely to experience varying levels of growth over the period, with initial growth resulting from construction projects or other investments, with some tailing off in later years.

Table H.B.7 Estimated Population of Southland Communities

Township	Census Actuals			Forecast Period				% change 2006-26
	1996	2001	2006	2011	2016	2021	2026	
Athol	66	54	72	76	74	72	70	-2.8%
Balfour	138	135	138	138	130	125	125	-9.4%
Browns	96	108	99	98	98	95	90	-9.1%
Colac Bay	177	150	135	138	140	140	140	3.7%
Dipton	156	156	147	143	135	130	125	-15.0%
Edendale	567	570	495	535	535	520	510	3.0%
Fortrose	63	54	57	56	54	51	45	-21.1%
Garston	93	66	102	100	100	100	95	-6.9%
Gorge Road	195	159	168	168	168	168	160	-4.8%
Limehills/Centre Bush	204	225	258	265	270	275	275	6.6%
Lumsden	564	516	474	450	430	410	370	-21.9%
Manapouri	213	243	306	320	330	340	340	11.1%
Mossburn	273	246	237	235	235	235	210	-11.4%
Nightcaps	396	336	303	255	215	190	180	-40.6%
Ohai	504	399	351	295	245	200	170	-51.6%
Orepuki	102	81	78	78	75	70	70	-10.3%
Otautau	801	729	753	755	770	785	770	2.3%
Riversdale	411	414	456	465	470	470	460	0.9%
Riverton	1839	1659	1527	1530	1540	1530	1510	-1.1%
Stewart Island	417	387	405	410	415	420	410	1.2%
Te Anau	1779	1851	1878	2005	2150	2,200	2,175	15.8%
Thornbury	87	72	75	75	75	75	70	-6.7%
Tokanui	168	174	162	166	170	170	170	4.9%
Tuatapere	741	681	582	580	595	610	595	2.2%
Waikawa/Curio Bay	96	96	96	100	105	105	95	-1.0%
Waikaia	75	87	96	100	100	100	95	-1.0%
Wallacetown	708	660	636	638	640	640	620	-2.5%
Winton	2373	2271	2310	2370	2490	2630	2585	11.9%
Woodlands	282	264	237	240	250	250	240	1.3%
Wyndham	639	573	516	520	530	520	488	-5.4%
Total Rural	16,338 53.5%	15,303 53.3%	15,291 53.8%	15,596 54.0%	15,866 54.0%	15,974 54.0%	15,542 54.0%	1.6%
Total Urban	14,223 46.5%	13,416 46.7%	13,149 46.2%	13,304 46.0%	13,534 46.0%	13,626 46.0%	13,258 46.0%	0.8%
Total District	30,561	28,719	28,440	28,900	29,400	29,600	28,800	1.3%

Table H.B.8 Estimated Number of Dwellings for Southland Communities

Township	Census Actuals			Forecast Period			
	1996	2001	2006	2011	2016	2021	2026
Athol	33	36	51	51	51	51	49
Balfour	51	57	57	56	56	55	54
Browns	39	39	36	35	35	34	33
Colac Bay	66	57	54	54	54	54	54
Dipton	57	54	54	52	51	50	49
Edendale	237	222	222	232	232	228	225
Fortrose	30	24	24	23	23	22	20
Garston	30	27	33	33	33	33	32
Gorge Road	69	63	63	61	61	61	58
Limehills/Centre Bush	81	81	84	84	87	88	88
Lumsden	216	207	210	202	198	193	180
Manapouri	96	105	102	104	109	111	111
Mossburn	96	90	93	92	92	92	85
Nightcaps	171	144	135	122	112	105	98
Ohai	171	144	135	120	108	97	84
Orepuki	39	33	30	30	29	28	28
Otautau	309	288	294	294	298	301	293
Riversdale	162	162	180	185	186	186	182
Riverton	729	711	663	663	666	664	655
Stewart Island	234	234	258	258	259	259	253
Te Anau	717	750	795	822	858	871	860
Thornbury	27	27	27	27	27	27	24
Tokanui	63	60	60	60	61	61	61
Tuatapere	261	255	240	240	244	248	241
Waikawa/Curio Bay	45	51	54	54	55	55	53
Waikaia	42	45	57	57	57	57	54
Wallacetown	231	231	237	237	238	238	231
Winton	957	960	1011	1016	1046	1081	1063
Woodlands	105	102	108	107	108	107	102
Wyndham	243	237	225	225	228	226	218
Total Rural	5,409 <i>49%</i>	5,445 <i>50%</i>	5,499 <i>50%</i>	5,484 <i>49%</i>	5,548 <i>49%</i>	5,527 <i>49%</i>	5,342 <i>49%</i>
Total Urban	5,607 <i>51%</i>	5,496 <i>50%</i>	5,592 <i>50%</i>	5,596 <i>51%</i>	5,662 <i>51%</i>	5,683 <i>51%</i>	5,538 <i>51%</i>
Total District	11,016	10,941	11,091	11,080	11,210	11,210	10,880

9.2 Implications for the Activity

Covered separately.

9.3 Future Demand for Activity Name Services

Covered separately.

Attachment 'C'

**The Likely Implications of the Forecast Future Demand and Other Matters that
Will Need to be Taken Into Account When Formulating the Future
Management Approach**

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1. Introduction

These notes summarise the likely future implications of the forecast future demand for land transport services in Southland.

They also identify some other matters that will need to be taken into account when formulating the future management approach.

2. Population Trends

Private cars used by the permanent population, even if it increases significantly, have little comparative impact on pavement deterioration.

However, the rapid development of some of the coastal and lakeside areas may create an accelerated need for improvements in some specific areas (eg Te Anau).

3. Forestry Harvesting

The extent of the impact on the road network, of increasing forestry development, is influenced by the specific locations of the forests and the locations of the processing facilities. A research project¹⁰ into traffic generation and maintenance implications prepared for Transit New Zealand identified that forestry related traffic:

- a) Could be predicted based on the age demographics of each forest; and
- b) Has the potential to have an increased 'whole of life' maintenance cost which can be predicted based on a combination of increased loading and predicted deterioration in roughness¹¹.

Forest maintenance activities during the forest life are not likely to be significant. Rayonier have identified that internal sources of aggregates to be found within each forest are likely to be used for road construction and maintenance gravelling. Therefore, only predicted traffic directly associated with log movement has been built into the analysis.

Statistics from the existing plantings¹² in Southland and assessments of the most likely travel routes to collectors or arterials were used to predict the potential increase in maintenance requirements as a result of forestry development. While these predictions are linked to a particular time, changes in market conditions and industry capacity may result in significant changes in actual harvesting dates.

Projections of forest age supplied by Ministry of Agriculture and Forestry (MAF) shows a consistent level of growth in the amount of additional forestry available for harvest each year for the time span of this activity management plan with a large increase in 15-20 years time.

¹¹ The study concluded that, from a variety of engineering experiences, forestry development on a minor rural road would result in an increase in NAASRA roughness of approximately 60 counts. The additional maintenance costs were then those that could be economically justified to maintain the original condition.

¹² Rayonier, Southwood Exports, Invercargill City Council and Southland District Council forests are estimated at 75% of the plantings in Southland.

4. The Growth in Dairying

The following factors were used in determining the future predictions:

- a) Wheel loadings for milk tankers are based on 50% of the journey empty, 20% of the journey half full, and 30% of the journey fully laden.
- b) Whey transport is 5% of milk transport from September to December only. This will vary seasonally and is dependent on excess processing capacity.
- c) The allowances made for transport of fertiliser and silage, stock movement and temporary gravel for lane construction and maintenance in an average year, with conversion spread over 10 years would be 30% of milk transport.

There are also costs associated with the establishment of the farm conversion and ongoing maintenance.

Any move to have a hub for milk collection and railing from the hub to the factory has not been allowed for as if it did happen it is likely to mainly reduce the load on the State Highways.

5. Tourism

Tourism is a high profile area for the Council – and one with a level of public liability risk.

Tourists require a higher level of information signage and optimum pavement conditions.

Many lack the skills required to drive safely on gravel roads, and fail to appreciate the risks.

The demand factors associated with tourism include:

- a) Improved directional and information signage.
- b) Improved delineation.
- c) Improved rest areas.
- d) Reduction in the width restrictions on gravel roads.
- e) Seal extensions on some Heritage Trail roads.
- f) Seal widening where safety factors are involved.
- g) Safety improvements on corners.

6. Other Factors that will Influence How the Council Decides to Best Meet the Identified Demand

Other factors that might affect the way that the Council should best address the District's new capital needs include:

- a) Changing legislative requirements.
- b) Changes in the way that NZTA oversees New Zealand's land transport needs, their management and level of, criteria for, and timing of funding.
- c) Changes in the way the Council itself decides to manage the activity from a strategic point of view.
- d) Higher standards set by Government and Government Agencies.
- e) Local affordability.
- f) The potential move to selected heavy vehicle routes (50T). No allowance has been made in this plan for upgrades associated with this at this stage.
- g) The introduction of an Emissions Trading Scheme (ETS) will have an effect on the transportation activity. This effect has not been allowed for at this stage in this Plan as there is too much uncertainty, with the change to a National Party Minority Government, regarding the timing, detail and likely effects.

While costs of goods and services required to operate and maintain the network will increase there is a chance that the dampening effect this has on the economy may reduce the traffic and its associated damage on the network.

Should there be a one off cost increase due to this, it can be managed in a similar fashion to the potential for cost fluctuation allowances being too low. This would mean that at annual plan time, there may need to be an increase in costs signalled that exceeds that forecast in the LTCCP. Alternatively, if it is manageable, it could be absorbed and a step increase be introduced to deal with it at the time that the 2012 LTAcMP and LTCCP are developed.

- h) Possible technological changes, including:
 - i) **Surface Sealing Products and Methods**
There is the potential that improvements in polymers may result in longer lasting seals.

However, experience with the introduction of these products in the past suggests that in many cases, there will be additional costs as products are developed.

No allowance has been made in any forward estimates at this stage for any savings associated with this technology.
 - ii) **Stabilising Agents or Road Construction and Heavy Maintenance**
These methods are proving effective for maintenance where there is sufficient pavement depth and will slightly reduce the need for heavy vehicles to carry aggregate.

In time, they have the potential to reduce both maintenance and construction costs.

7. Conclusion

The overall implications of continual demand for improvements in levels of service, a slow growth in population and of increasing numbers of heavy vehicles on the road are:

- a) An increased rate of deterioration on road pavements;
- b) An increasing focus on road user safety; and
- c) The need for an increased level of expenditure on the assets to maintain the intended levels of service.

In order to quantify the extent of impact, demand projections have been made over all sectors that can be analysed. Traffic growth is expected to be as follows:

- a) With the increases in primary production, especially in timber and in milk production, heavy vehicle usage will increase.
- b) People are increasing the amount that they use light vehicles, (the national growth rate for the use of vehicles is 2% per annum), and so, including an increased number of tourists, the number of cars and light vehicles on the roads will increase.

As has been said earlier, the growth in the number of cars and light vehicles will have little impact, but the growth in the number of heavy vehicles is a different matter, and so additional work has been done in that area.

There is an increasing amount of classified traffic data available. From this, an increasing level of heavy vehicle usage is shown. The existing data gives variable results because of a lack of consistent standard count locations, but this will be improved with a series of these count stations now established.

Exact demand projections are very hard to make as evidenced by the major changes experienced over the past years.

To help with this a formalised traffic count programme is now set up which includes control stations which will better provide traffic growth figures.

The likely impact that projected traffic growth will have on capacity, ride quality, and expenditure is highly subjective. However, what is clear is that the rate of wear caused by the increased heavy traffic is expected to be greater than the rate of overall traffic growth, therefore the requirement for heavy duty maintenance and pavement rehabilitation is likely to grow while the population remains relatively static – clearly causing a funding dilemma.

This is especially so when the age profile of the existing pavements is also taken into account as detailed in Appendix F, Attachment B.

Many of the sealed roads were originally constructed with only thin pavements. It was never envisaged that they would have to carry the heavy traffic that they do today.

Also, many rural roads only carry a small volume of heavy traffic, and even a small change can have a rapid adverse impact on them.

The various methodologies for calculating the effects of current and projected increased volumes of heavy traffic that are likely to be experienced as a result of the demand factors listed above indicate that the Council should be carrying out pavement rehabilitation work on a significantly increasing quantity of sealed roads each year. (See Appendix F, Attachment B).

The actual amount of pavement rehabilitation work done in recent years is shown in Table F.B.1.

8. Seal Extensions

The District has a large proportion of unsealed roads and there is continual pressure to seal more of them, predominantly by the rural community. The policy to invest in seal extensions changes over time depending on the community and the elected Council. Sealing of the roads has significant consequences in the long term because of maintenance and asset deterioration issues. The decision to extend the seal is therefore not one that can be confidently forecast.

While there is an ongoing desire from ratepayers for seal extension of their own road or the ones they travel on the most, there is also a realisation that SDC can not afford to seal all of its roads. There is the potential that local ratepayer funding could be used in special circumstances or special rating areas to get specific sections of seal extension done. At this stage no funding has been allowed in this Plan for seal extensions.

9. New/Upgraded Roads for Urban Development

- Construction of new roads inside the sub-division or development.
- Upgrading of roads outside the sub-division to service the new demand.

The construction of new roads within new subdivisions is generally funded by the developers and must be constructed in accordance with the Council's Engineering Standards. On completion, provided the roads and associated assets comply with the Engineering Standards, they are vested in the Council (i.e. Council takes over ownership). There are few capital expenditure implications with this type of asset creation, the more significant implications are maintenance and renewal related.

The upgrading of roads external to the new development, required to service the new demand or growth in demand, is an asset creation issue. This is not seen as being a major issue in Southland District at this stage as most subdivisions are occurring in areas with good adjoining roads to start with. Where it is an issue the costs will be partly offset by development contributions which can be charged to the developer.

At the time of the initial development of this Plan there was potential that upgrading roads due to the growth associated with subdivisions could involve 14 km over the 10 year life of this Plan. This assumed that the various subdivision known of by Council all proceed and justify this level of upgrade. Given the financial crisis occurring in 2008/09 this is seen as unlikely. To make an allowance for some of this upgrading to occur (which will mainly take the form of seal extensions), \$100,000 per year has been allowed for seal extensions. When combined with Development Contributions, this should provide sufficient funds to achieve approximately one kilometre per annum of seal extension.

As at April 2009, only a very limited amount of growth costs has been allowed for.