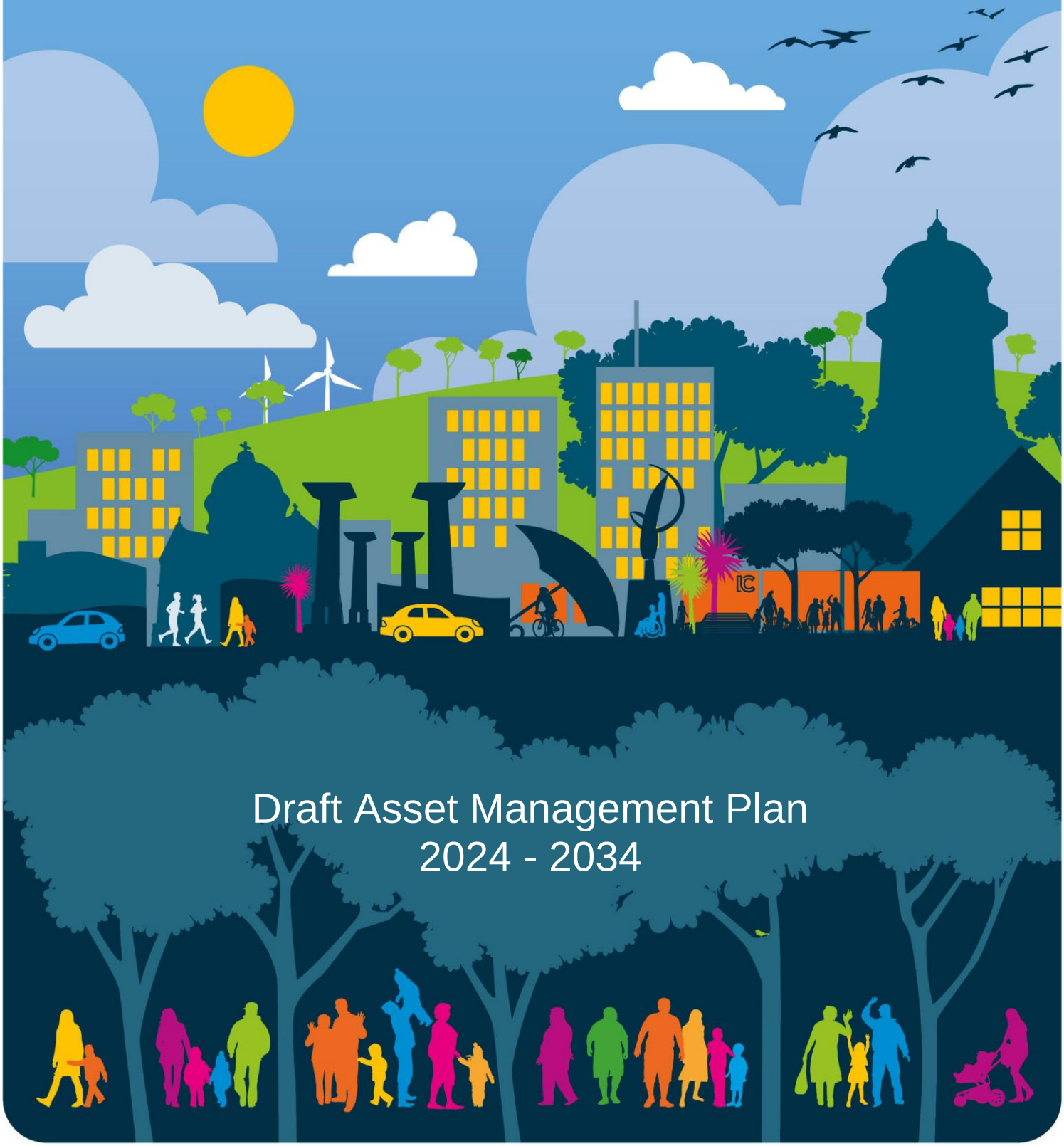
Invercargill
CITY COUNCIL

Roading



Draft Asset Management Plan
2024 - 2034

Asset Management Plan

Activity	Roading		
	Name	**Signature**	**Date**
Prepared By	Lesley McCoy		
Asset Manager	Lesley McCoy		
Strategic Asset Planning Manager	Doug Rodgers		
Group Manager Review	Erin Moogan		
Peer Review	Mark Gordon		
Council Adoption			

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TABLE OF CONTENTS

2
Changes to be incorporated in Next Review 3
List of Tables 11
List of Figures 16
Executive Summary 19
1. Introduction to the AMP 27
1.1 Purpose of the AMP 27
1.2 Rationale for the Activity 28
2. Strategic Context 31
2.1 Overview 31
2.2 National Context 32
2.2.1 Ministry of Transport Strategic Outcomes Framework 32
2.2.2 Government Policy Statement on Land Transport (GPS) 33
2.2.3 Waka Kotahi NZ Transport Agency Context 35
2.2.4 One Network Framework (ONF) 46
2.3 Southland Regional Context 48
2.3.1 Beyond 2025 Southland – Regional Long Term Plan 48
2.3.2 Regional Land Transport 50
2.4 Invercargill City Context 52
2.4.1 Invercargill Today 52
2.4.2 Transport System Overview 52
2.4.3 Long Term Plan (LTP) 55
2.4.4 30 Year Infrastructure Strategy 57
2.5 Strategic Assessment 58
2.5.1 Alignment with Strategic Context 58
2.5.2 Business Case Approach 61
2.5.3 Problems, Benefits and Consequences 62
2.5.5 Desired Outcomes 66
2.6 The Evidence Base 68
2.6.1 Safety 68
2.6.2 Asset Condition and Performance 76
2.6.3 Resilience and Climate Change 91
2.6.4 Accessibility 93

2.7 Strategic Problems, Benefits and Response....95
2.8 Strategic Case Summary....96
2.9 Key Assumptions....98
2.9.1 Internal, Financial and External Factors....98
2.9.2 Other Assumptions....118
2.9.3. Key Messages....119
3. The Service We Provide....120
3.1 Customer Profile....120
3.1.1 Our Stakeholders and Community....120
3.1.2 How We Engage our Communities....121
3.1.3 Community Research....122
3.1.4 Key Service Attributes Valued by Customers....123
3.2 Service Drivers....125
3.2.1 Community Expectations....125
3.2.2 Legislative Requirements....127
.2.3 Industry Standards and Guidelines....128
3.3 Levels of Service....129
3.3.1 Alignment of Customer Levels of Service with Community Outcomes....129
3.3.2 Customer Levels of Service....130
3.3.3 How Did We Measure Up in the Last Year....131
3.3.4 ONF Technical Levels of Service....132
3.4 Levels of Service Issues and Challenges....134
3.4.1 Current Levels of Service Gaps and Possible Responses....134
3.4.2 Level of Service Target Trends....138
4. Demand for Our Services....141
4.1 Demand Forecast....141
4.1.1 Factors Influencing Demand....141
4.1.2 Projected Growth or Decline in Demand for the Service....144
4.2 Changes in Service Expectations (Future Levels of Service)....145
4.3 Expected Implications for the Activity....146
4.4 Future Demand Issues and Challenges....148
4.4.1 Possible Asset-related Demand Responses....148
4.4.2 Non-Asset Solutions....149
4.4.3 Managing Expectations....150
4.4.4 Key Messages – Demand....150
5. Asset Profile....151
5.1 Asset Overview....151
5.2 Asset Description....151

5.2.1 Network Characteristics 153
5.2.2 Traffic Volumes 155
5.2.3 Asset Lives 155
5.2.2 Sealed Pavements 157
5.2.3 Unsealed Pavements 160
5.2.4 Kerb and Channel / Surface Water Channels / Drainage Culverts 160
5.2.5 Footpaths and Cycleways 162
5.2.6 Traffic Services 164
5.2.7 Structures 167
5.2.8 Carparking 168
5.2.9 Other Assets 169
5.2.10 Public Transport Assets 169
5.3 Critical Assets 170
5.3.1 Asset Criticality Criteria 170
5.3.2 Identification of Critical Assets 171
5.4 Asset Condition 172
5.4.1 Condition Inspections and Surveys 172
5.4.2 Sealed Roads Condition 173
5.4.3 Footpaths Condition 178
5.4.4 Structures Condition 179
5.4.5 Traffic Services Condition 179
5.4.6 Condition Monitoring Frequencies 180
5.5 Asset Capacity and Performance 180
5.5.1 Network Performance 180
5.5.2 Asset Capacity and Utilisation 181
5.6 Road Safety 182
5.6.1 Crash Trends 182
5.6.2 ONRC Comparisons 184
5.6.3 Summary of Key Road Safety Issues 186
5.7 Summary of Asset Trends, Issues and Challenges 187
6. Sustainability, Risk and Resilience 188
6.1 Sustainability 188
6.1.1 Social and Cultural 188
6.1.2 Environmental 189
6.1.3 Climate Change 189
6.1.4 Economic and Financial 189
6.1.6 Summary of Sustainability Challenges and Issues 190
6.2 Risk 190

6.2.3 Critical Assets Decision-Making 191
6.2.4 Risk Identification and Assessment 192
6.2.5 Summary of Key Risk Issues 192
6.2.6 Possible Approaches to Risk Mitigation 192
6.3 Resilience 193
6.3.1 Resilience Definition 193
6.3.2 Business Continuity and Emergency Response Arrangements 194
6.3.3 Current and Desired Resilience Assessment 194
6.3.4 Summary of Resilience Issues and Challenges 194
6.4 Negative Effects 195
7. Managing Our Activities (Programme Business Case) 199
7.1 Responding to the Issues and Challenges 199
7.1.1 Strategic Responses 199
7.1.2 Investment Areas 199
7.1.3 Investment Approach 200
7.1.4 Programme Case Evaluation 205
7.2 Lifecycle Activities 206
7.2.1 Operations and Maintenance Strategy 206
7.2.2 Operations and Maintenance Standards and Specifications 207
7.2.3 Renewal Strategy 208
7.2.4 Renewal Criteria / Intervention Standards 209
7.2.5 Asset Development Strategy 210
7.2.6 Capital Development Selection Criteria 211
7.2.7 Asset Disposals 212
7.2.8 Programme Work Categories 212
7.2.9 Alignment with Strategic Responses 214
7.3 Sealed Roads Pavements 217
7.3.1 Sealed Roads Pavement Maintenance 217
7.3.2 Sealed Roads Pavement Renewals 218
7.3.3 Sealed Roads Technical Analysis 219
7.3.4 Sealed Roads Programme Evaluation 226
7.3.5 Sealed Roads Capital Development 228
7.3.6 Sealed Roads Programme Story on a Page 229
7.4 Unsealed Roads Pavements 234
7.4.1 Unsealed Roads Pavement Maintenance 234
7.4.2 Unsealed Roads Pavement Renewals 235
7.4.3 Unsealed Roads Programme Evaluation 236
7.4.3 Unsealed Roads Capital Development 237

7.4.4 Unsealed Pavements Activity – Story on a Page 237
7.5 Structures 239
7.5.1 Structures Maintenance 239
7.5.2 Structures Renewals 240
7.5.3 Structures Programme Evaluation 241
7.5.3 Structures Capital Development 242
7.5.4 Structures Activity Summary and Programme Needs 242
7.6 Kerb and Channel / Drainage 244
7.6.1 K&C / Drainage Maintenance 244
7.6.2 K&C / Drainage Renewals 245
7.6.3 K&C / Drainage Programme Evaluation 248
7.6.3 K&C / Drainage Capital Development 250
7.6.4 K&C / Drainage Activity Summary and Programme Needs 250
7.7 Footpaths and Cycleways 252
7.7.1 Footpaths and Cycleways Maintenance 252
7.7.2 Footpaths and Cycleways Renewals 253
7.7.3 Footpaths and Cycleways Programme Evaluation 254
7.7.3 Footpaths and Cycleways Capital Development 256
7.7.4 Footpaths and Cycleways Activity Summary and Programme Needs 257
7.8 Traffic Services 259
7.8.1 Traffic Services Maintenance 259
7.8.2 Traffic Services Renewals 260
7.8.3 Traffic Services Programme Evaluation 261
7.8.3 Traffic Services Capital Development 262
7.8.4 Traffic Services Activity Summary and Programme Needs 263
7.9 Environmental Maintenance and Renewal 265
7.9.1 Environmental Maintenance 265
7.9.2 Environmental Renewals 265
7.9.3 Environmental Maintenance Programme Evaluation 265
7.9.3 Environmental Maintenance Activity Summary and Programme Needs 266
7.11 Carparking 268
7.11.1 Carparking Maintenance 268
7.11.2 Carparking Renewals 268
7.11.2 Carparking Programme Evaluation 268
7.11.3 Car Parking Capital Development 269
7.12 Other Assets – Unsubsidised 270
7.12.1 Other Assets Maintenance 270
7.12.2 Other Assets Renewals 270

7.12.2 Other Assets Capital Development 271
7.13 Emergency Works and Minor Events 271
7.14 Resilience Improvements 272
7.15 Low Cost Low Risk Improvements 275
7.16 Promotion of Road Safety and Demand Management Activities 277
7.17 Investment Management Work Categories 281
7.17.1 Asset Management Planning 281
7.17.2 Programme Business Case Development 282
7.18 Network and Asset Management 282
7.19 Recommended Programme 285
7.19.1 Evaluation of Options / Alternative Programmes 285
7.19.2 Recommended Investment Management and Operation / Maintenance Programmes 285
7.7.3 Recommended Renewal Programmes 285
7.7.4 Recommended Capital Development and Community Education Programmes 286
7.20 How the Activity will be Resourced 286
7.20.1 Internal Resourcing 286
7.20.2 Procurement Strategy 287
8. Financial Management 290
8.1. Overview 290
8.2 Financial Summary – What the Activity Costs 290
8.2.1 Council Funded Programmes (includes Inflation) 291
8.2.2 NZTA Assisted Programmes (includes Inflation) 299
8.2.3 Programme Implications 301
8.3 Financial Policies 301
8.4 How We Pay for the Activity 301
8.5 Asset Valuation Forecasts 303
8.5.1 30-year Valuation and Depreciation Forecast 303
8.6 Procurement 305
8.7 Confidence Levels in Programmes 308
8.7 Reliability of Financial Forecasts 310
8.7.1 Revenue Forecasts 310
8.7.2 Operational Forecasts 310
8.7.3 Maintenance and Renewal Forecasts 310
8.7.4 Development Forecasts 311
8.8 Summary of Programme Assumptions 311
9. DELIVERING AND MONITORING THE PROGRAMME 316

9.1 Programme Governance and Reporting 316
Frequency of Review 316
9.2 Stakeholder Engagement and Communications 318
9.3 Business Processes 319
9.4 Information Systems and Data 320
9.5 Programme Performance Monitoring and Review 322
9.5.1 Monitoring Approach 322
9.5.2 Frequency of Review 323
10. Continuous Improvement 324
10.1 Current Activity Management Practice 324
10.2 Improvements from 2021 Activity Management Plan 326
10.2.2 2017 AMP Improvement Plan Status 326
10.2.3 Te Ringa Maimoa Alignment 334
10.3 Improvement Programme 335
10.3.1 Improvement Actions identified in Current AMP 335
10.3.2 Improvement Plan Programme 336
10.4 Monitoring and Review 341
10. 11. Glossary 342
11. Appendices 343

List of Tables

Table 2.1 Community Outcomes 55
Table 2.2 How Roading Contributes 56
Table 2.3 Alignment of Objectives 60
Table 2.4 Summary of Asset Groups (excluding pavements)....79
Table 2.5 Natural Hazards....92
Table 2.6 Strategic Case Summaries 96
Table 2.7 GPS 2021 Gaps....97
Table 2.8 .... **Error! Bookmark not defined.**
Table 2.9 Key Assumptions - Internal, Financial and External Factors....98
Table 2.10 118
Table 3.1 Our Stakeholders and Community 120
Table 3.2 Community Expectations 125
Table 3.3 Legislative Requirements....127
Table 3.4 Industry Standards and Guidelines 128
Table 3.5 Alignment between Customer Levels of Service and the Outcomes 129
Table 3.6 Mandatory Measures (DIA)....130
Table 3.7 ONRC Measures .... **Error! Bookmark not defined.**
Table 3.8 Council Measures .... **Error! Bookmark not defined.**
Table 3.9 Performance Reporting for Roading....131
Table 3.10 Current Levels of Service Gaps and Possible Responses....134
Table 3.11 Planned Customer Levels of Service 139
Table 4.1 Factors Influencing Demand 141
Table 4.2 Expected Implications for the Activity....146
Table 5.1 Asset Description....152
Table 5.2 Network Statistics for Network Length (KM) and Journeys Travelled 154
Table 5.3 Asset Type and Useful Life 156
Table 5.4 Lengths of Sealed Surfaces by ONRC Classification 157
Table 5.5 Table of Sealed Roads Top Surface Materials....157
Table 5.7 Unsealed Road Lengths by ONRC Hierarchy 160
Table 5.8 Channels 161
Table 5.9 Sizes and Types of Culverts by Material 162
Table 5.10 Footpath Network by Materials 163
Table 5.11 Pole Ownership 165
Table 5.12 List of Sign Assets 165
Table 5.13 Railings by Type 167

Table 5.14 Construction Type of Bridges 168
Table 5.15 Location of Bridges 168
Table 5.16 Carparks 169
Table 5.17 Bus Shelters 170
Table 5.18 Asset Criticality Criteria 171
Table 5.19 Identification of Critical Assets 171
Table 5.20 Condition Monitoring Survey and Frequency Results 180
Table 6.1 High Risk Identification and Assessment 192
Table 6.2 Approaches to Risk Mitigation 192
Table 6.3 Monitoring and Managing Negative Effects 195
Table 7.1 201
Table 7.2 206
Table 7.3 Primary Types of Maintenance Carried Out on Main Assets 207
Table 7.4 Priority Ranking Table for Planned and Reactive Replacement Works 210
Table 7.5 NZTA's Work Categories for Financial Assistance 211
Table 7.6 Subsidised Roading Activities 213
Table 7.7 Unsubsidised Roading Activities 214
Table 7.8 Linkage between Strategic Responses and Activity / Asset Classes 215
Table 7.9 Sealed Road Pavement Maintenance 217
Table 7.10 Sealed Road Pavement Maintenance - Primary Types of Maintenance Activity 217
Table 7.11 Sealed Road Pavements Renewals - Work Categories 218
Table 7.12 Sealed Road Pavements Renewals - Primary Types of Renewal Work 218
Table 7.13 Sealed Road Treatment Types 220
Table 7.14 Forward Works Programme Assessment 221
Table 7.15 dTIMS Analysis 222
Table 7.16 dTIMS 30 Year Analysis 223
Table 7.17 Annual Life Cycle Costs 226
Table 7.18 Average 3 to 10 Year Programmes - $5.0m Budget **Error! Bookmark not defined.**
Table 7.19 Average 30 Year Programmes - $5.5 and $5.0m Budgets **Error! Bookmark not defined.**
Table 7.20 Sealed Roads Short Term Forecasts ($000) 228
Table 7.21 Sealed Roads 10 Year Forecasts ($000) 228
Table 7.22 Sealed Pavements Short Term Forecasts ($000) 228
Table 7.23 Sealed Pavements 10 Year Forecasts ($000) 228
Table 7.24 Sealed Roads – Subdivision Locations 229
Table 7.25 Unsealed Pavement Maintenance 234

Table 7.26 Unsealed Pavement Maintenance - Primary Types of Maintenance Activity ..234
Table 7.27 Unsealed Pavement Renewals ..235
Table 7.28 Unsealed Pavement Renewals - Primary Types of Renewal Activity ..235
Table 7.29 Unsealed Roads Short Term Maintenance Forecasts ($000) ..237
Table 7.30 Unsealed Roads 10 Year Maintenance Forecasts ($000) ..237
Table 7.31 Unsealed Roads Short Term Renewal Forecasts ..237
Table 7.32 Unsealed Roads 10 Year Renewal Forecasts ..237
Table 7.33 Structures Maintenance ..239
Table 7.34 Structures Maintenance - Primary Types of Maintenance Activity ..239
Table 7.35 Structures Renewals ..240
Table 7.36 Structures Renewals - Primary Types of Renewal Activity ..240
Table 7.37 Structures Short Term Maintenance Forecast ($000) ..241
Table 7.38 Structures 10 Year Maintenance Forecast ($000) ..241
Table 7.39 Structures Short Term Renewals Forecast ($000) ..241
Table 7.40 Structures 10 Year Renewals Forecast ($000) ..241
Table 7.41 Routine Drainage Maintenance ..244
Table 7.42 Routine Drainage Maintenance - Primary Types of Maintenance Activity ..244
Table 7.43 Drainage Renewals ..245
Table 7.44 K&C Historical Renewal Costs ..... **Error! Bookmark not defined.**
Table 7.45 K&C Historical Renewal Costs ..246
Table 7.46 Developing the Forward Works Programme ..246
Table 7.47 Kerb and Channel / Drainage Short Term Maintenance Forecast ($000) ..249
Table 7.48 Kerb and Channel / Drainage 10 Year Maintenance Forecast ($000) ..249
Table 7.49 Kerb and Channel / Drainage Short Term Renewals Forecast ($000) ..249
Table 7.50 Kerb and Channel / Drainage 10 Year Renewals Forecast ($000) ..249
Table 7.51 Footpaths and Cycle Path Maintenance ..252
Table 7.52 Footpaths and Cycle Path Maintenance - Primary Types of Maintenance Activity ..252
Table 7.53 Footpaths and Cycleways Renewals ..253
Table 7.54 Footpaths and Cycleways Renewal Strategy ..253
Table 7.55 Footpaths and Cycleways Short Term Maintenance Forecast ($000) ..256
Table 7.56 Footpaths and Cycleways 10 Year Maintenance Forecast ($000) ..256
Table 7.57 Footpaths and Cycleways Short Term Renewals Forecast ($000) ..256
Table 7.58 Footpaths and Cycleways 10 Year Renewals Forecast ($000) ..256
Table 7.59 Footpaths and Cycleways Improvements ..256
Table 7.60 Traffic Services Maintenance ..259
Table 7.61 Traffic Services Maintenance - Primary Types of Maintenance Activity ..259
Table 7.62 Network Services Renewals ..260

Table 7.63 Network Services Renewals - Primary Types of Renewal Activity.....261
Table 7.64 Traffic Services Short Term Maintenance Forecast ($000) 262
Table 7.65 Traffic Services 10 Year Maintenance Forecast ($000).....262
Table 7.66 Traffic Services Short Term Renewal Forecast ($000).....262
Table 7.67 Traffic Services 10 Year Renewal Forecast ($000) 262
Table 7.68 Environmental Maintenance.....265
Table 7.69 Environmental Renewals 265
Table 7.70 Environmental Maintenance Short Term Forecast ($000) 266
Table 7.71 Environmental Maintenance 10 Year Forecast ($000) 266
Table 7.72 Carparking Maintenance.....268
Table 7.73 Carparking Renewals.....268
Table 7.74 Carparking Short Term Maintenance Forecast ($000) 268
Table 7.75 Carparking 10 Year Maintenance Forecast ($000).....269
Table 7.76 Carparking Short Term Renewal Forecast ($000).....269
Table 7.77 Carparking 10 Year Renewal Forecast ($000) 269
Table 7.78 Other Assets Maintenance.....270
Table 7.79 Other Assets Renewals 270
Table 7.80 Emergency Works and Minor Events 272
Table 7.81 Resilience Improvements.....272
Table 7.82 Resilience Improvements Short Term Forecast ($000) 273
Table 7.83 Resilience Improvements 10 Year Forecast ($000).....274
Table 7.84 Low Cost Low Risk Improvements 275
Table 7.85 Low Cost Low Risk Improvements Programme.....276
Table 7.86 Low Cost Low Risk Short Term Forecast ($000).....276
Table 7.87 Low Cost Low Risk 10 Year Forecast ($000) 277
Table 7.88 Community Education Programmes.....277
Table 7.89 Recommended Community Education Programme Short Term Forecast ($000) 278
Table 7.90 Recommended Community Education Programme 10 Year Forecast ($000) 279
Table 7.91 Asset Management Planning 281
Table 7.92 Activity Management Planning Short Term Forecast ($000) 281
Table 7.93 Activity Management Planning 10 Year Forecast ($000).....281
Table 7.94 Programme Business Case Development.....282
Table 7.95 Activity Management Planning Short Term Forecast ($000) 282
Table 7.96 Activity Management Planning 10 Year Forecast ($000).....282
Table 7.97 Network and Asset Management 282
Table 7.98 Network and Asset Management Short Term Forecast ($000).....283
Table 7.99 Network and Asset Management 10 Year Forecast ($000) 283

Table 7.100 NZTA Work Categories 285
Table 7.101 Recommended Renewal Programmes 285
Table 7.102 Recommended Capital Development and Community Education Programmes 286
Table 7.103 Anticipated Works 288
Table 8.1 560000_2019 Works and Services Roading Services 291
Table 8.2 560000_2019 Works and Services Roading Services 292
Table 8.3 56100_2019 Roading Services – Land Transport Program **Error! Bookmark not defined.**
Table 8.4 Funding included in Council budgets (561000) in NZTA Funding Categories **Error! Bookmark not defined.**
Table 8.5 2018-2021 Road Funding 302
Table 8.7 Confidence Levels in Programmes 308
Table 8.8 Confidence Levels and Areas of Uncertainty of Major Assets Categories 309
Table 8.9 Relative Asset Grouping within Roading 309
Table 10.1 Asset Management Practices 324
Table 10.2 2017 AMP Improvement Actions 326
Table 10.3 New Improvement Actions 335
Table 10.4 Improvement Programme 336

List of Figures

Figure 1.1 Transport System Relationships 29
Figure 2.1 31
Figure 2.2 MoT Transport Outcomes 32
Figure 2.3 GPS Strategic Direction – Priorities and Objectives 33
Figure 2.4 GPS 2021 Key Outcomes 34
Figure 2.5 Arataki Overview.....36
Figure 2.6 ..... **Error! Bookmark not defined.**
Figure 2.7 Arataki Southland Region at a Glance ..... **Error! Bookmark not defined.**
Figure 2.8 Joint Strategic Results Framework.....51
Figure 2.9 Schematic Layout of the Roading Network 53
Figure 2.10 ONRC Classifications 53
Figure 2.11 Context of Long Term Plan 57
Figure 2.12 Principles and Desired Behaviours of the BCA 61
Figure 2.14 The Right Amount of Effort.....62
Figure 2.15 2018 Workshop Part Two (Key Theme Analysis) 62
Figure 2.16 ILM Problem Statements.....66
Figure 2.17 ILM Benefits Map (2020).....67
Figure 2.18 3-Years Crash Trends.....69
Figure 2.19 Peer Group 2018/19 Comparison 70
Figure 2.20 Serious Injuries and Fatalities 71
Figure 2.21 Collective Risk 73
Figure 2.22 Personal Risk.....74
Figure 2.23 DSI at Intersections.....75
Figure 2.24 Vulnerable Road Users DSI 75
Figure 2.25 Proportion of travel on roads smoother than the threshold 77
Figure 2.26 85th Percentile Roughness 78
Figure 2.27 WC111 - Sealed Pavement Maintenance 80
Figure 2.28 WC212 - Sealed Road Resurfacing ..... **Error! Bookmark not defined.**
Figure 2.29 WC214 - Sealed Road Pavement Rehabilitation **Error! Bookmark not defined.**
Figure 2.30 WC113 & 213 - Routine Drainage Maintenance and Renewal 80
Figure 2.31 WC112 - Unsealed Pavement Maintenance.....81
Figure 2.32 WC211 - Unsealed Road Metalling ..... **Error! Bookmark not defined.**
Figure 2.33 WC121 & 221 - Environmental Maintenance and Renewal**Error! Bookmark not defined.**

Figure 2.34 WC122 & 222 - Traffic Services Maintenance and Renewal**Error! Bookmark not defined.**
Figure 2.35 WC151 - Network and Asset Management ..... **Error! Bookmark not defined.**
Figure 2.36 WC123 - Operational Traffic Management..... **Error! Bookmark not defined.**
Figure 2.37 Cost Efficiency 2 – Chip Seal Resurfacing Quantities 2015/16 to 2019/20.....82
Figure 2.38 Cost Efficiency 2 – Proportion of Network Chip Seal Resurfaced (2019/20).....83
Figure 2.39 Cost Efficiency 2 – Chip Seal Resurfacing (2019/20 Cost / lane-km) – Peer Group 83
Figure 2.40 Cost Efficiency 2 – Chip Seal Resurfacing (4-Year Average Life to 2019/20) – Peer Group 84
Figure 2.41 Cost Efficiency 3 - Asphalt Resurfacing Quantities 2015/16 to 2019/20 85
Figure 2.42 Cost Efficiency 3 – Proportion of Network Asphalt Resurfaced (2019/20) 86
Figure 2.43 Cost Efficiency 3 – Asphalt Resurfacing (2019/20 Cost/Lane-km) – Peer Group 86
Figure 2.44 Cost Efficiency 3 – Asphalt Resurfacing (4-Year Average Life to 2019/20) – Peer Group.....88
Figure 2.45 Cost Efficiency EM10 – Routine Pavement Maintenance Costs (2019/20).....89
Figure 2.46 ONRC Classifications – Urban Network..... **Error! Bookmark not defined.**
Figure 4.1 Change in Demographic 143
Figure 5.1 Relative Value of the Assets (based on replacement costs).....153
Figure 5.2 Network % Length (km) & Journeys Travelled (veh km).....154
Figure 5.3 Pavement Use by AADT range 154
Figure 5.4 Sealed v Unsealed Proportion 155
Figure 5.5 Traffic Volumes (Vehicle Kilometres Travelled on Network) 155
Figure 5.6 RSL - Chip seals.....158
Figure 5.7 RSL - Asphaltic Concrete.....158
Figure 5.8 Pavement Ages 159
Figure 5.9 Age Profile of Kerbs and Channels by Installation Date 161
Figure 5.10 Age Profile of Culverts by Installation Date 162
Figure 5.11 Footpath Age 163
Figure 5.12 Footpath Age Distribution (Years) by Material Type 164
Figure 5.13 Sign Age 166
Figure 5.14 Number of Railings versus Age (Years) 167
Figure 5.15 Bridge Age Distribution by Quantity and Material Type**Error! Bookmark not defined.**
Figure 5.16 Sealed Road Roughness Distribution ONRC 173
Figure 5.17 Sealed Road Roughness Distribution Urban / Rural.....174

Figure 5.18 Smooth Travel Exposure....175
Figure 5.19 Amenity Customer Outcome 2: Peak Roughness - Urban Sealed Roads 175
Figure 5.20 STE Condition Index by Years....175
Figure 5.21 Historical Rutting Distribution - HSD Survey....176
Figure 5.22 Average Texture Profile Depth (mm)....177
Figure 5.23 Condition Index for all Sealed Roads in Invercargill City 177
Figure 5.24 Pavement Integrity for all Sealed Roads in Invercargill City 178
Figure 5.25 Condition Comparison - 2014 and 2017....179
Figure 5.26 Ten Year Crash Severity Trends....182
Figure 5.27 Ten Year Crash Movement Trends....183
Figure 5.28 Location of Crashes on the ICC Road Network 2010-2020....184
Figure 5.29 Detailed Analysis of Crash Locations (2015 to 2020)**Error! Bookmark not defined.**
Figure 5.30 Customer Outcome 1: Number of Serious Injuries and Fatalities (DSI)....185
Figure 5.31 Safety Customer Outcome 3 - Personal Risk....185
Figure 7.1 Balance between Planned and Unplanned Maintenance 207
Figure 7.2 K&C Long Term Renewal Projection....248
Figure 7.3 250
Figure 7.4 255
Figure 8.1 Total Expenditure Over 10 Years....
Figure 8.2 Total Expenditure Over 30 Years....294
Figure 8.3 Funding Over 10 Years ....
Figure 8.4 Funding Over 30 Years....296
Figure 8.5 Depreciation vs Capital Renewals Over 10 Years....297
Figure 8.6 Depreciation vs Capital Renewals Over 30 Years....297
Figure 8.7 306
Figure 9.1 Programme Governance and Reporting....317
Figure 9.2 Management Structure of the Invercargill City Council**Error! Bookmark not defined.**
Figure 10.1 Key Asset Management Inputs 324
Figure 10.2 334

Executive Summary

This Asset Plan has been developed to ensure that the Roading Activity can be sustainably delivered for Invercargill in a way that meets legislative requirements, seeks to meet levels of service expected by customers, and which helps enable investment support from our co-funder Waka Kotahi New Zealand Transport Agency (Waka Kotahi).

Who are we?

We are responsible for providing a safe, connected and accessible transport system within Invercargill City. We maintain our City's roads, footpaths, cycleways and related assets such as streetlights, roadside drainage, bridges, and other structures.

The transport activity includes network planning and the delivery of walking, cycling and roading projects that improve safety, help reduce carbon emissions and encourage active transport. We also look after the public transport activity and run community road safety education and promotion activities.

We work closely with Waka Kotahi who are responsible for State Highways in our province, and with Environment Southland who are responsible for strategic transport planning and environmental management across the region.

What we are seeking to achieve?

Council's vision is *"Our City with heart" / "He Ngākau Aroha";* delivering the mission statement of *"Waihopai – To Leave in Good Order"* with a focus on the Community Outcome below:

- One Community – Our Youth, Older people, different neighbourhoods and communities' basic needs are met, and they feel valued and proud to live here.
- A vibrant, safe city centre which meets our people's diverse cultural needs.
- A healthy, resilient environment where the city is well positioned to navigate climate change.
- A future focused economy delivered through innovation and partnership and supported by appropriate infrastructure.

About this Plan

This Plan looks to align the Levels of Service provided to its customers with the Community Outcomes above, together with those developed nationally through the One Network Road Classification and One Network Frameworks. These outcomes set the performance standards appropriate for delivering work programmes, with which the Council's network and current levels of service are well aligned.

The Plan assesses the problems facing the City's transport system and identifies the benefits that investment could deliver to the community. It describes the evidence underpinning these problems and establishes investment priorities.

While for many sub-activities our current delivery programmes and investment levels are relatively consistent and do not need additional investment, a significant increase in maintenance and renewals is considered necessary for some, in particular, pavements (and surfacing).

The Investment Story

What are we asking for?

The Why (what are the problems?)

Invercargill has good roading capacity which needs to be continually maintained and it is relatively uncongested compared to other cities in New Zealand.

However, there are a range of problems that need to be addressed, as summarised below. It is against this backdrop that the Plan has been developed.

- Behaviour and user choices and network layout is resulting in fatal & serious injuries.
- The historical design & changing use has led to modal conflict, limited accessibility & not meeting expectations.

What are the Benefits if we address the problems?

The investment to address these problems would primarily work towards:

- Continuous improvement of road users safety – 50%
- Improved community connectivity and social wellbeing – 30%
- Contribute to economic growth and productivity -20%

How should this occur (what are the Strategic Responses)?

There are numerous investment responses that the Council proposes to pursue in addressing these transport problems, and they are focussed around:

- Ensure streets and roads are delivering the right outcomes for users to feel safe in their use.
- Work collaboratively and telling a more effective story with partners, stakeholders and the community.
- Ensure that land use and the transport network work effectively together.

These responses are underpinned by Council's 30 year Infrastructure Strategy and Responses:

- Maintain our current asset base
- Renew assets at the rate of asset consumption
- Focus on asset criticality
- Plan and invest for resilience for critical assets
- Focus on sound evidence-based activity decision making.
- Better understand and meet our community's needs, through consultation and delivery of agreed levels of service.
- Ensure a viable competitive supplier market exists and is maintained in the region.
- Strengthen asset management processes, tools, data and expertise.
- Deliverability – ensure suitable and adequate resource availability.

The key corporate strategic issues and challenges faced by Council

In addition to the specific transport problems described above, this Plan also responds to a range of wider issues:

- Ongoing support of Waka Kotahi and the Government to align their investment with the needs of the provinces and the population.
- The current Funding Assistance Rate (FAR) of 51%.
- Meeting the changing needs of our rangatahi as part of our wider population, which is growing older and more diverse
- Delivering city centre renewal
- Enabling the housing, health, security and social infrastructure our city needs to grow
- Navigating increasingly complex environmental challenges including climate change, land contamination and earthquake risks.
- Maintaining Community affordability in a time of economic volatility - Core infrastructure, major projects and levels of service will be delivered with financial prudence and efficiency
- Ensuring Council leadership and delivery is credible and effective, building community trust and engagement.

The Roading Network

The Invercargill roading network consists of 295 km of urban sealed roads and 302 km of rural roads, with about 123km of the rural road being unsealed roads. Council provides and manages 55 bridges, 500 km of footpaths (including off road cycle lanes) along with over 7,000 streetlights, six off street carparks and 740 metered parking spaces within the CBD of the City.

The assets have a replacement value (June 2022) of about $692 million, and a current depreciated value of $280 million. The assessed annual depreciation (or consumption of the assets) is $12.3 million.

Levels of Service – key issues

Safety

Council has a good road network but has higher safety risks (when considered against national peers) for vulnerable road users (elderly, pedestrians and cyclists) together with drivers at intersections. The City's intersections were ranked worst in the country in from 2019 up to and including 2022 in the Communities at Risk register. This poor safety record is a key Level of Service issue. A step change is required here to have an impact.

	2017	2018	2019	2020	2021	2022
All deaths and serious casualties	47	31	28	29	29	21
Young drivers (aged 16-24yrs)	26	21	8	13	13	18
Alcohol and/or drugs	49	36	37	33	22	29
Speed (too fast for the conditions)	60	60	44	41	44	26
Urban intersections	15	11	7	8	9	12
Rural intersections	3	4	3	6	5	14
All intersections	3	2	1	1	1	1
Rural road loss of control and/or head-on	61	60	56	48	49	23
Motorcyclist involved	54	36	48	34	31	47
Cyclist involved	1	7	7	10	2	5
Pedestrian involved	1	7	9	14	33	27
Driver Distraction	58	8	19	16	16	11
Fatigue	56	60	40	40	42	51
Older road users (>75years)	14	8	15	9	5	4
Restraints (seatbelt not worn)	42	43	38	39	45	50

Pavement Smooth Travel Exposure (STE) and condition

The state of our roads is deteriorating (condition and STE) and the costs of maintenance once surface and pavement health falls below a certain threshold are set to grow exponentially. Invercargill roads are smoother than the national average but this is trending downwards and does not account for aging of the surfaces. Significant investment in renewals is needed now to maintain our existing network to an appropriate sustainable standard.

Resilience and Climate Change

Communities are still vulnerable to a range of natural hazards, some will become worse with climate change. i.e. Bluff community disconnected from Invercargill if SH 1 is closed. Environmental issues will need attention – stormwater quality, air quality, noise and vibration. Adaption of transport choices to lower carbon options will change the way the network is used and type of conflict on the network.

There is a particular gap in expectations relating to pavement smoothness between our customers, our co investors (Waka Kotahi) and potentially our elected representatives. The conversation needed is around what are these expectations and is there a willingness and ability to pay for more to get safer, more resilient and road which are in better condition.

Growth and Demand – key issues

Invercargill is not exposed to high traffic growth nor other demands on the network. Invercargill has a well-structured grid network and low exposure, in general, to resilience and sustainability issues. The network is well connected to the State Highway network and has many advantages of being linked closely to a nationally maintained arterial highway.

Key issues include:

- Growth is not an issue in relation to road capacity
- Increasing customer expectations
- Freight movements and freight corridors
- Growth in active transport and other modes
- Rising stormwater quality expectations
- Enhancing streets as community “Spaces and Places”
- Climate change and natural hazards impacts (also a levels of service issue)
- Dust impacts (on adjacent properties) on unsealed roads (also a levels of service issue)

- Peri-urban level of service improvements (Ōtātara)

Risk – key issues

The AMP addresses a wide range of risks in accordance with AS/NZS ISO 31000:2009, with the more significant risks being:

- Bridge damage due to earthquake or flooding
- Unsafe roads due to external actions such as vandalism or climatic conditions
- Unsafe roads due to underfunding maintenance and renewals and not responding
- Legislative change or loss of corporate knowledge
- Contamination of unformed road reserve land

The Council maintains a risk register that documents all identified risks, the current management strategy and any additional controls or mitigations needed.

Lifecycle Management

Lifecycle activities include the following:

- **Planning and investment management** – planning for and managing the transport system.
- **Operational** – the costs of electricity, managing traffic, cleaning or other activities that do not physically change the asset.
- **Maintenance** – the day-to-day activities needed to keep assets operating at the required service levels.
- **Renewals** – capital works that replace but do not increase or improve an asset's original design capacity or condition.
- **Capital Additions** – new assets which increase the size of the portfolio, increasing capacity or improving levels of service.
- **Disposal** – removal of existing assets from service.

Our lifecycle objectives are:

- **Asset preservation** – focus on managing asset condition while meeting the needs of different transport modes and users.
- **Safety** – addressing the City's crash problems and improving safety performance needs to be a strong focus, to reduce crashes, deaths and serious injuries, especially on intersections and to vulnerable users.
- **Prudent risk management** – a transport system where the risks from climate change and potential hazards are managed to acceptable levels.
- **Perpetuity of assets** – address inter-generational loss of service potential due to asset deterioration through appropriate operational, maintenance and renewal activities.
- **Value-for-money** – optimise and prioritise investments to achieve best whole-of-life costs, while meeting agreed levels of service.

In developing the Programme Case an optioneering process was conducted to test alternative options and investment strategies, in particular for pavements, drainage and footpaths.

This included advanced pavement deterioration modelling with the report providing key inputs into selecting the most suitable maintenance, resurfacing and renewal programmes. Detailed analysis showed that the current annual funding level of around $4.4 million for resurfacing and rehabilitation is not financially sustainable in the long term, with at least $7.6 million per annum considered appropriate to preserve the assets and the levels of service to road users over a 10-year programme. This level of investment will ensure optimal life for pavements by waterproofing the surface. A high level of investment is required in the first 3-year of the plan due to over 16% (asphalt) and 20% (chipseal) surfacing being over its expected life.

Footpaths is an area where Council has previously adopted a higher risk approach, not fully funding asset consumption (depreciation) but managing renewal and maintenance whilst monitoring the condition. This situation is changing as the asset base ages and greater demands are becoming apparent – a more proactive renewal programme is now proposed with a transition as the selected and managed approach.

For drainage, the proposed programme offers a balance between optimising lifecycle costs (including the adjoining pavement), risk management, and aesthetics. It continues to deliver a programme at similar levels using the current programming approach.

New capital programmes are now largely delivered through the Low Cost Low Risk work category following Waka Kotahi expansion of qualifying activities and financial thresholds in this category.

Investment Needs

In addition to lifecycle drivers, renewal and new capital programmes are also heavily influenced by the City Centre upgrade.

Proposed investment programmes are summarised below:

Work Programme	Cat	Project Description	2024/25	2025/26	2026/27	Total 2024/27
Investment Management	3	Activity Management Planning	$ 210,000	$ 85,000	$ 15,000	$ 310,000
Investment Management	4	Programme Business Case Development	-	-	-	-
		Subtotal Investement Management	**$ 210,000**	**$ 85,000**	**$ 15,000**	**$ 310,000**
Work Programme	**Cat**	**Project Description**	**2024/25**	**2025/26**	**2026/27**	**Total 2024/27**
Maintenance and Operations	111	Sealed pavement maintenance	$ 2,300,000	$ 2,300,000	$ 2,300,000	$ 6,900,000
Maintenance and Operations	112	Unsealed pavement maintenance	$ 275,000	$ 275,000	$ 275,000	$ 825,000
Maintenance and Operations	113	Routine drainage maintenance	$ 420,000	$ 420,000	$ 420,000	$ 1,260,000
Maintenance and Operations	114	Structures maintenance	$ 150,000	$ 175,000	$ 175,000	$ 500,000
Maintenance and Operations	121	Environmental maintenance	$ 490,000	$ 490,000	$ 490,000	$ 1,470,000
Maintenance and Operations	122	Traffic services maintenance	$ 815,000	$ 815,000	$ 815,000	$ 2,445,000
Maintenance and Operations	123	Operational traffic management	$ 125,000	$ 133,000	$ 135,000	$ 393,000
Maintenance and Operations	124	Cycle path maintenance	$ 285,000	$ 285,000	$ 285,000	$ 855,000
Maintenance and Operations	125	Footpath maintenance	$ 345,000	$ 345,000	$ 345,000	$ 1,035,000
Maintenance and Operations	131	Level crossing warning devices	$ 30,000	$ 30,000	$ 75,000	$ 135,000
Maintenance and Operations	151	Network and asset management	$ 1,415,000	$ 1,315,000	$ 1,315,000	$ 4,045,000
		Subtotal Maintenance and Operations	**$ 6,650,000**	**$ 6,583,000**	**$ 6,630,000**	**$ 19,863,000**
Work Programme	**Cat**	**Project Description**	**2024/25**	**2025/26**	**2026/27**	**Total 2024/27**
Renewals	211	Unsealed road metalling	$ 360,000	$ 360,000	$ 360,000	$ 1,080,000
Renewals	212	Sealed road resurfacing	$ 6,100,000	$ 5,600,000	$ 7,200,000	$ 18,900,000
Renewals	213	Drainage renewals	$ 1,120,000	$ 1,120,000	$ 1,120,000	$ 3,360,000
Renewals	214	Sealed road pavement rehabilitation	$ 1,300,000	$ -	$ 3,500,000	$ 4,800,000
Renewals	215	Structures component replacements	$ 570,000	$ 70,000	$ 70,000	$ 710,000
Renewals	222	Traffic services renewals	$ 875,000	$ 570,000	$ 670,000	$ 2,115,000
Renewals	224	Cycleway renewals	$ -	$ -	$ -	$ -
Renewals	225	Footpath Renewals	$ 2,728,000	$ 2,100,000	$ 2,100,000	$ 6,928,000
		Subtotal Renewals	**$ 13,053,000**	**$ 9,820,000**	**$ 15,020,000**	**$ 37,893,000**
Work Programme	**Cat**	**Project Description**	**2024/25**	**2025/26**	**2026/27**	**Total 2024/27**
Road Improvements	321	New Traffic Management Facilities	$ -	$ -	$ -	$ -
Road Improvements	322	Replacement of Bridges and Structures	$ -	$ -	$ -	$ -
Road Improvements	323	New Roads	$ -	$ -	$ -	$ -
Road Improvements	324	Road Improvements	$ -	$ -	$ -	$ -
Road Improvements	325	Seal Extensions	$ -	$ -	$ -	$ -
Road Improvements	332	Property Purchase	$ -	$ -	$ -	$ -
Road Improvements	333	Advanced Propoerty Purchase	$ -	$ -	$ -	$ -
Road Improvements	341	Low Cost Low Risk	$ 3,444,000	$ 3,484,000	$ 3,444,000	$ 10,372,000
Road Improvements	357	Resilence Improvements	$ -	$ -	$ -	$ -
		Subtotal Road Improvements	**$ 3,444,000**	**$ 3,484,000**	**$ 3,444,000**	**$ 10,372,000**
Work Programme	**Cat**	**Project Description**	**2024/25**	**2025/26**	**2026/27**	**Total 2024/27**
Road Safety Promotion and Demand Management	432	Safety, promotion, education and advertising	$ 385,000	$ 385,000	$ 385,000	$ 1,155,000
	421	Travel Demand Management	$ -	$ -	$ -	$ -
		Subtotal RSP and Demand Management	**$ 385,000**	**$ 385,000**	**$ 385,000**	**$ 1,155,000**
Work Programme	**Cat**	**Project Description**	**2024/25**	**2025/26**	**2026/27**	**Total 2024/27**
Walking and Cycling Improvements	451	Walking Facilities	$ -	$ -	$ -	$ -
	452	Cycling Facilities	$ -	$ -	$ -	$ -
		Subtotal Walking and Cycling Improvements	**$ -**	**$ -**	**$ -**	**$ -**

Asset Management Practices

Council has good knowledge of its assets and corporate engineering and asset management abilities along with robust delivery contracts, meaning it is able to develop programmes needed by the asset portfolio and deliver them.

We procure services in a robust, sustainable, effective and timely manner and deliver them at a cost that is both appropriate and fair. A review of delivery (Section 17A (of the LGA) review 2022) concluded that the current structure and delivery mechanisms remain the most appropriate approach for Council.

This Plan highlights through using the Government's Asset Management Maturity Assessment Tool (from Treasury Better Business Case Approach) that the asset planning process is well

placed and growing in maturity. It is reasonable to be confident in the Plan and its programmes in delivering the outcomes required and outlined.

A robust improvement programme has been determined and the resourcing needed to deliver it is understood, with some confidence that it can be delivered.

Council has developed and accepted a robust Asset Management Policy (Appendix 1) and an Infrastructural and Financial Strategy, and this Plan is aligned to these documents ensuring the information needed is able to flow into the Long Term Plan with some reliability.

1. Introduction to the AMP

1.1 PURPOSE OF THE AMP

The Asset Management Plan (AMP) outlines how and why Invercargill and its partners will want to invest in roading assets and the transport activity.

This Plan sets out the strategic reasoning linking local and central government policy directions with the business case thinking (and options) for investment in the transportation activity. The AMP has a 30 year focus with detailed consideration of a ten-year view designed to prioritise and address key transportation issues and how they are to be managed. The ten year view is an input into the Long Term Plan

Transport is fundamental to ensuring a high quality of life and a thriving economy within Invercargill City. There is increasing pressure on the road network and the Council needs to address current and future issues. To achieve this, we are focused on maintaining defined levels of service and addressing the pressures on the system through prudent and cost-effective management of the network.

The challenge of the activity is to manage the assets in such a way that the right asset is in the right condition and when works are needed, it is undertaken at the right time in a coordinated way.

How we manage the asset includes:

- Preparation and implementation of this Asset Management Plan.
- Research, long term planning and policy development relating to roading services.
- Understanding risks and evaluating ways to minimise their impact on users.
- Understanding customers and delivering services to a level they agree to fund.
- Working closely with Waka Kotahi to ensure they continue to co-invest and support the activities direction.
- Leading teams of contractors, consultants and staff focussed on delivering the best possible service.
- Communicating with Councillors and key stakeholders to ensure they are a part of the decisions for the activity.

It is important that transport activities align with the Government expectations (which are outlined in the Government Policy Statement (GPS) for Transport) so that the opportunity for co-investment is created.

Waka Kotahi, as co-funder, requires a business case approach for securing funding for land transport programmes, supported by this AMP. The AMP uses business case principles and Waka Kotahi investment assessment to support the funding application. This process complements existing best practice guidance for AMPs such as the International Infrastructure Management Manual (IIMM) and ISO 55001, and provides investment confidence for Waka Kotahi. In parallel, the AMP must meet the expectations of the Council as a key building block for the Long Term Plan (LTP).

Sitting alongside the AMP business case approach is the One Network Framework (ONF) system, both being supported by Te Ringa Maimoa (formally known as Road Efficiency Group (REG)), a collaborative initiative of road controlling authorities across New Zealand.

The ONF involves categorising roads based on place and movement performance as part of a national network.

This new approach to classify the network is designed to enable better design, planning and delivery of a modern transport system to meet the increasing needs of people, businesses, communities, and impacts on our climate. The ONF recognises that streets not only keep people and goods moving, but they're also places for people to live, work, and enjoy. The ONF is designed to contribute to improving road safety and building more vibrant and liveable communities.

Movement and Place has many uses at the strategic network planning and development level, as well as at the detailed project level. It marries network-wide and local considerations. At its heart, the ONF organises transport links by their place and movement roles into road and street types.

The ONF is a tool to help establish priority uses, performance measures and potential interventions for each road and street type.

The ONF aligns with strategic transport planning at all levels including long term plans, Regional Land Transport Plans (RLTPs) and the NLTP. The classification is designed to assist local government and the Transport Agency to plan, invest in, maintain and operate the road network in a more strategic, consistent and affordable way throughout the country.

The ONF will be particularly key and important for the Invercargill City centre redevelopment given the influences the State Highway has on place functions adjacent to a busy highway with many truck movements. Investment in the transport activity needs to find the balance required for the community to have its centre as a people and business focus with place and space for community to thrive and be successful. Linking the CBD to ONF and GPS 2024 will have benefits for the transport purpose.

Council is in a period of transition to the ONF from the One National Road Classification (ONRC), some measures through Te Ringa Maimoa have more value measured with the historical data from the ONRC, when we have measured more consistently through the ONF measures will be transitioned to match.

1.2 RATIONALE FOR THE ACTIVITY

The transport activity is one of the core Infrastructural Services activities provided by the Invercargill City Council.

The transport network (and connected infrastructure) is a strategic asset and is significant in ensuring Council's capacity to contribute towards Community Outcomes and the wellbeing of the Community.

The Invercargill transport network consists of 596 km of roads of varying capability (294 km urban sealed, 301 km of rural roads including 123 km rural unsealed roads). The network is relatively compact, strong urban and peri-urban influencers, with some rural and unsealed roads.

Invercargill has a population of approximately 57,100 (2018 Census, assumption June 2023) and is the provincial centre for Southland. Like many areas Council sees population growth as a key for community sustainability.

Council fits in a Council peer group (>50% Urban) with Napier, Palmerston North and Porirua who should have similar transport needs and performance. Council also

manages bridges, footpaths (500 km), streetlights, car parking and traffic signals, and also manages delivery of the Passenger Services and Total Mobility activity (on behalf of Environment Southland).

The assets have a replacement value of about $692 million (in 2022) and a current value of $280 million. The assessed annual depreciation (or consumption of the assets) is $12.3 million.

The transport activity key aim is to provide a safe, effective and efficient transport "system" in the City. All components of the asset are to support a system approach.

This Transport Asset Management Plan is strongly linked to the overall strategic direction for the City and the wider region (for economic activity). Economic growth and productivity is assisted and managed through having a transport network capable of delivering access for both business and a growing and diverse local economy.

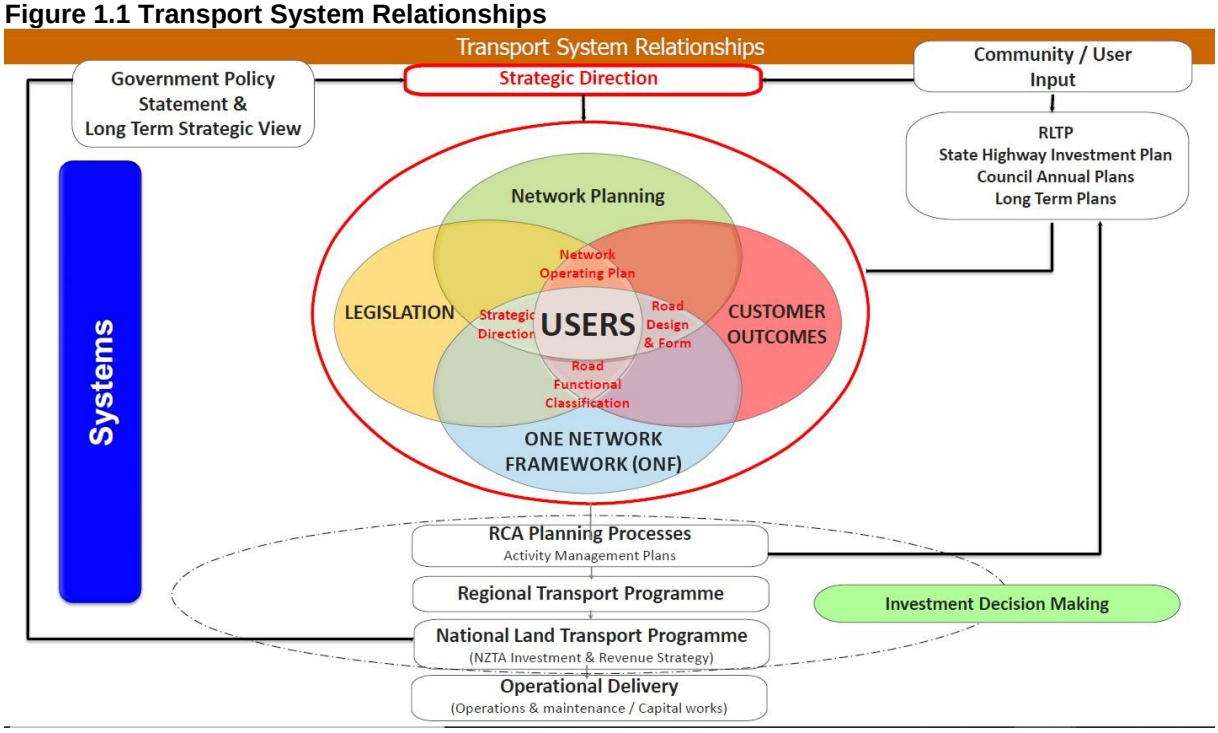
The City needs to grow and be supportive of the economy so trucks and freight can travel with reliability within the city. It needs to be sustainable and resilient to natural hazards and climatic changes but most importantly it needs to provide a safe environment for travel for everyone, pedestrians, cyclists and motorists.

The network must provide a safe system which supports a healthy lifestyle which is safe to travel around and contributes to a great City to live in. It must also be affordable and value for money in how it is delivered.

There are also legislative requirements placed on Local Government which requires councils to continue to maintain roading assets, once created to acceptable levels of service (and safety) as agreed with the Community through the LTP process.

The following graphic outlines how the system is formed and where it interacts.

Figure 1.1 Transport System Relationships



The AMP follows a business case approach to demonstrating the reasoning, options for and levels of investment which is required for the community to deliver agreed levels of service. Our customers (users) are the heart of our activity.

2. Strategic Context

2.1 OVERVIEW

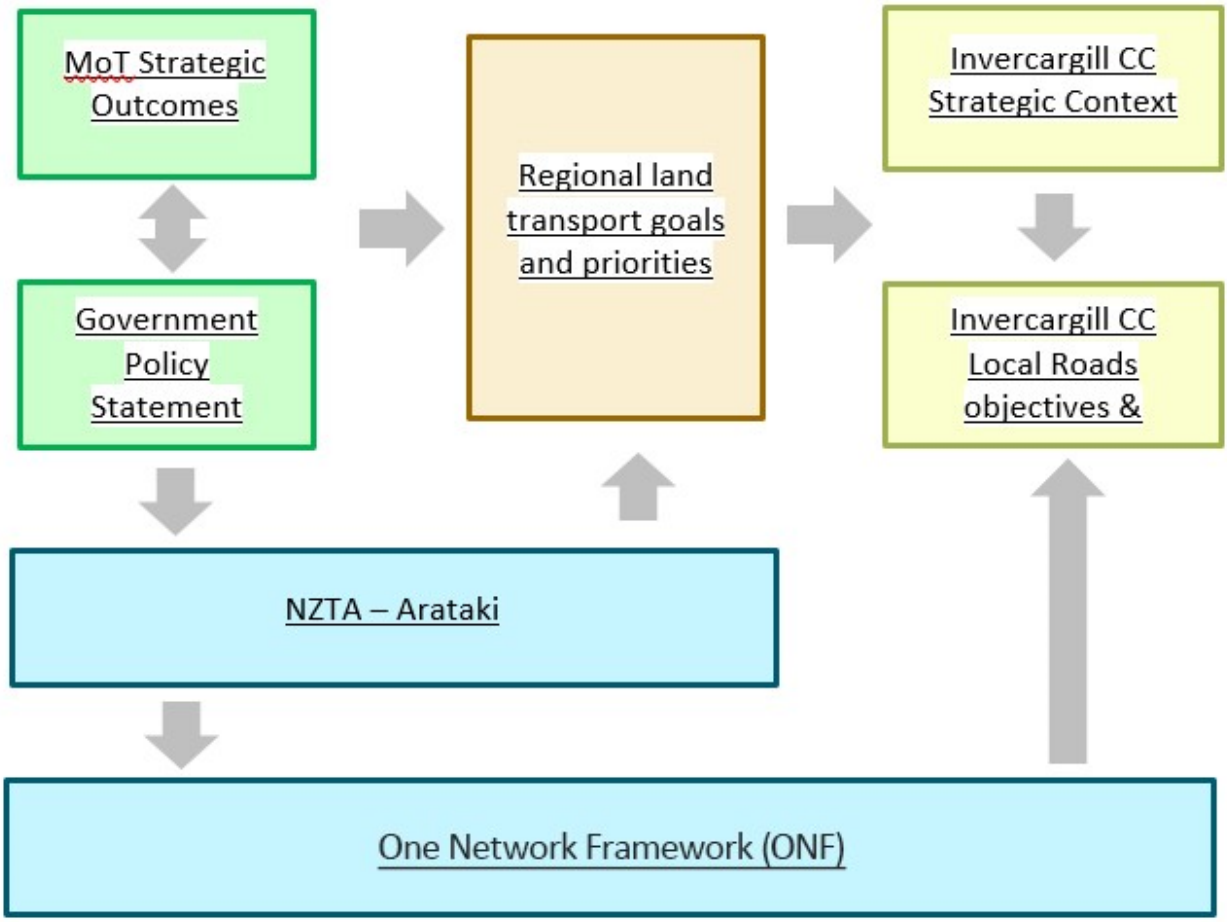
The Strategic Case outlines the context and case for investment for Invercargill City Council's transportation activity. It also provides the necessary framework for the Transport Asset Management Plan (AMP), a 30 year plan designed to prioritise and address key transportation issues and how they are to be managed.

The strategic case:

- Outlines the strategic context and regional fit for proposed investment;
- Identifies the key problems and rationale for investing; and
- Discusses the potential investment benefits.

It links the activity to national and regional land transport goals and outcomes. The following figure summarises this context, also highlighting how the ONF influences network investment decisions from national to local levels.

Figure 2.1



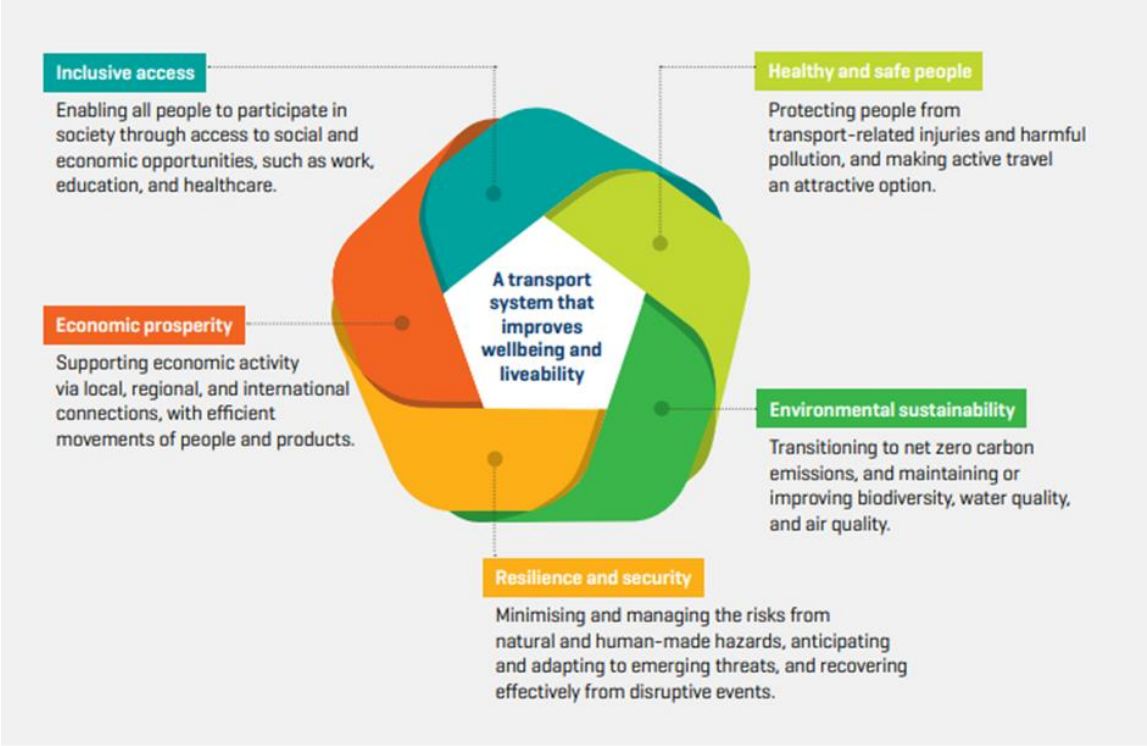
The section then goes on to describe the current and anticipated issues and challenges facing the network, the problem statements, potential consequences, and the benefits that ongoing investment in maintaining, renewing and improving the network is expected to have. The Strategic Case does not provide the detailed supporting evidence to justify this investment, however linkages are provided to sections within the Programme Business Case containing this information.

2.2 NATIONAL CONTEXT

2.2.1 Ministry of Transport Strategic Outcomes Framework

The strategic outcomes for the transport system are considered to be enduring and are centred on wellbeing and liveability, as shown below. They are also reflected in and consistent with the GPS priorities. The Outcomes Framework aligns with the Treasury's Living Standards Framework.

Figure 2.2 MoT Transport Outcomes



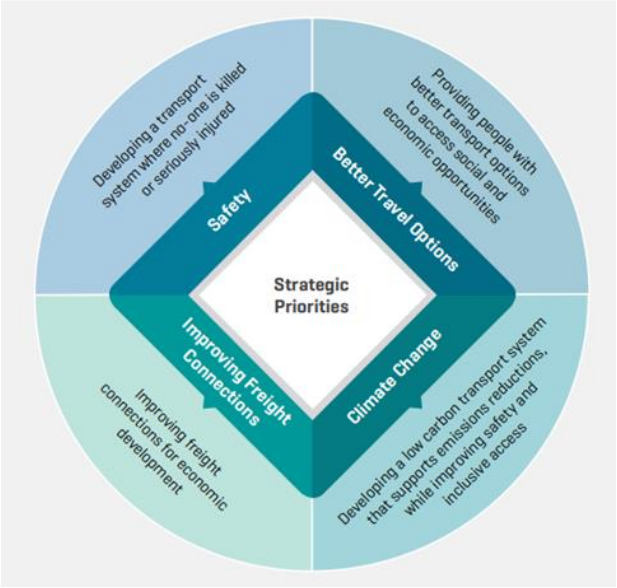
2.2.2 Government Policy Statement on Land Transport (GPS)

The GPS presents the Government's priorities for the next 10 years. GPS 2021 has four strategic priorities which are underpinned by a number of objectives and associated long-term 10-year results as shown in Figure 2.3.

Each priority has a primary outcome and a range of co-benefits, summarised in Figure 2.4**Error! Not a valid bookmark self-reference.**. Short to medium term results being targeted (by 2031) are also highlighted along with proposed indicators.

GPS 2021 has a section relating to principles for investing – transport investment decisions need to be transparent and provide the best possible impact and value to New Zealanders.

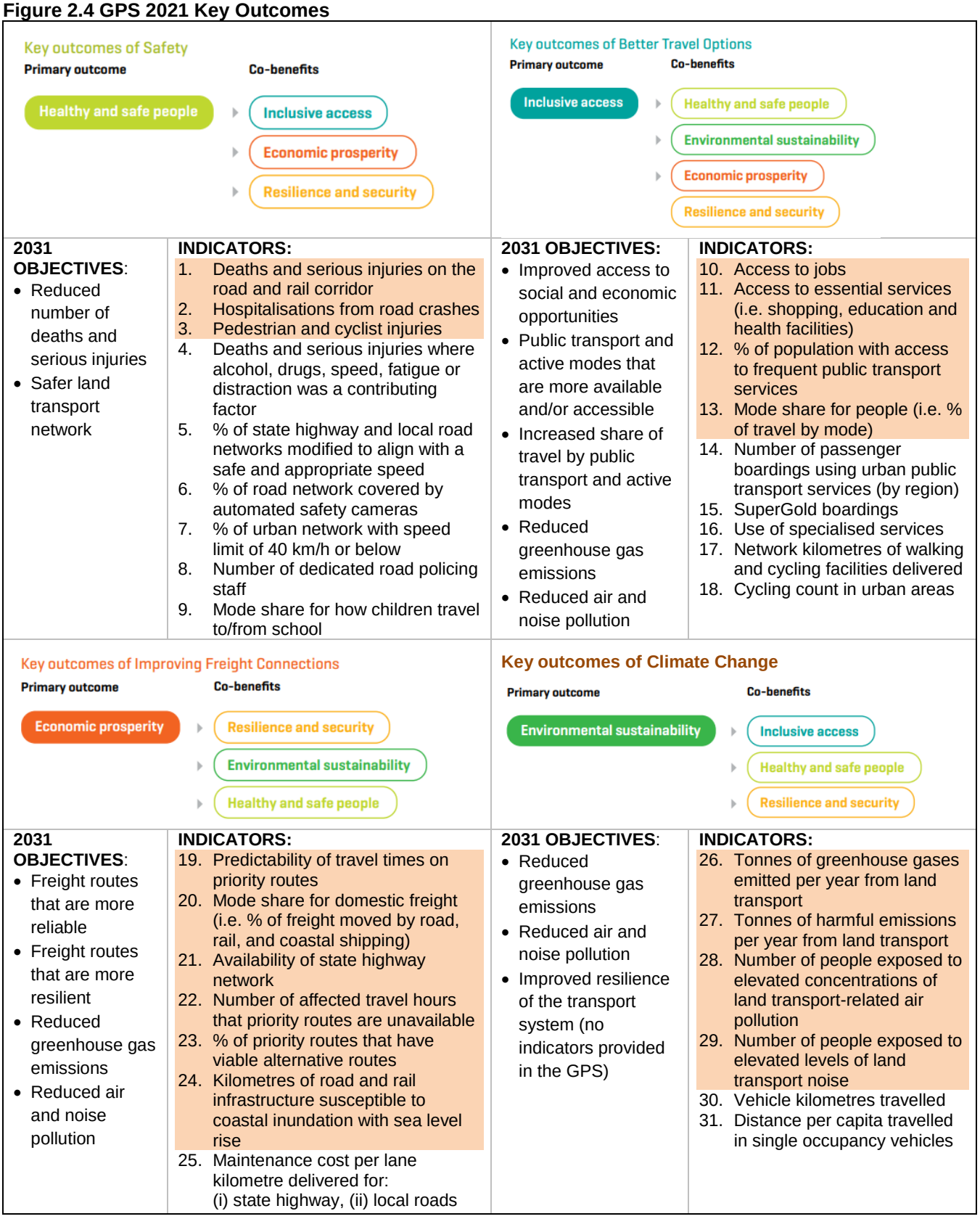
Figure 2.3 GPS Strategic Direction – Priorities and Objectives



For investment using the Land Transport Fund this means seeking value for money through:

- Alignment - Does investment align with the strategic priorities of the GPS?
- Effectiveness - To what extent does the proposal achieve the priorities of the GPS?
- Efficiency - Is this being achieved at the best cost for the results being delivered?

Figure 2.4 GPS 2021 Key Outcomes



The main indicators above are shaded, with supporting indicators below them.

2.2.3 Waka Kotahi NZ Transport Agency Context

In addition to its role as co-funder of the Invercargill land transport network, Waka Kotahi NZ Transport Agency manages the state highway network throughout the country.

The State Highway is a key network for Invercargill in that it segments the City into nearly four equal areas. It provides a key and sole link to Bluff. The resilience of the State Highway is of fundamental importance to having secure freight and transport access to the rest of the South Island and in particular the road access for commodities and fuel for the province.

Arataki

Arataki[1] is the 30-year view of what is needed to deliver on the government's current priorities and long-term objectives for the land transport system.

Arataki March 2023 replaces all previous versions, including *Arataki 2021-2031* and the *30-Year Plan: Baseline Network Version*. This release was launched as a prototype on a digital platform to support land transport planning and investment decisions. It focused on the actions Waka Kotahi (in collaboration with others) would need to make to the state highway network to achieve priority outcomes and deliver a fit-for-purpose land transport system.

As a foundation, Arataki uses the Transport Outcomes Framework from Te Manatū Waka Ministry of Transport. This framework sets long-term outcomes for the transport sector to work towards.

Arataki then applies a three-part conceptual framework to:

- understand the challenges the system faces
- apply an outcomes-led strategic approach
- provide clear direction towards a transport system that improves wellbeing and creates great places to live.

[1] Arataki - 30-year plan March 2023 | Waka Kotahi NZ Transport Agency (nzta.govt.nz)

Figure 2-5 provides an conceptual framework for Arataki.

Figure 2.5 Arataki Conceptual Framework



Arataki - Understanding the National challenge

To support wellbeing and create great places to live in Aotearoa New Zealand, the transport sector needs to focus less on the physical movement of people and goods (mobility), and more on safe, sustainable access and connectivity for all. This shift requires integration with digital, urban development, energy, and other related systems.

To achieve this, we need to:

- adapt to climate change and improve resilience
- better integrate transport and land use in our largest cities, and provide a wider range of options including walking, cycling, and public transport in smaller towns and cities
- improve access to transport for rural communities
- move freight more efficiently and safely
- maximise the benefits of technology, data, and innovation
- shift to an outcomes-based approach.

Figure 2.6 Arataki Drivers for Future Change



The greatest level of change needs to happen in the cities of Aotearoa. This is where nearly all future population growth is forecast to take place. Here, the transport system needs to be dramatically different, with better integration between land use and transport to support quality, mixed-use, compact urban form. In our largest cities, rapid transit networks need to enable, support, and shape urban development, while connecting more people to jobs and each other.

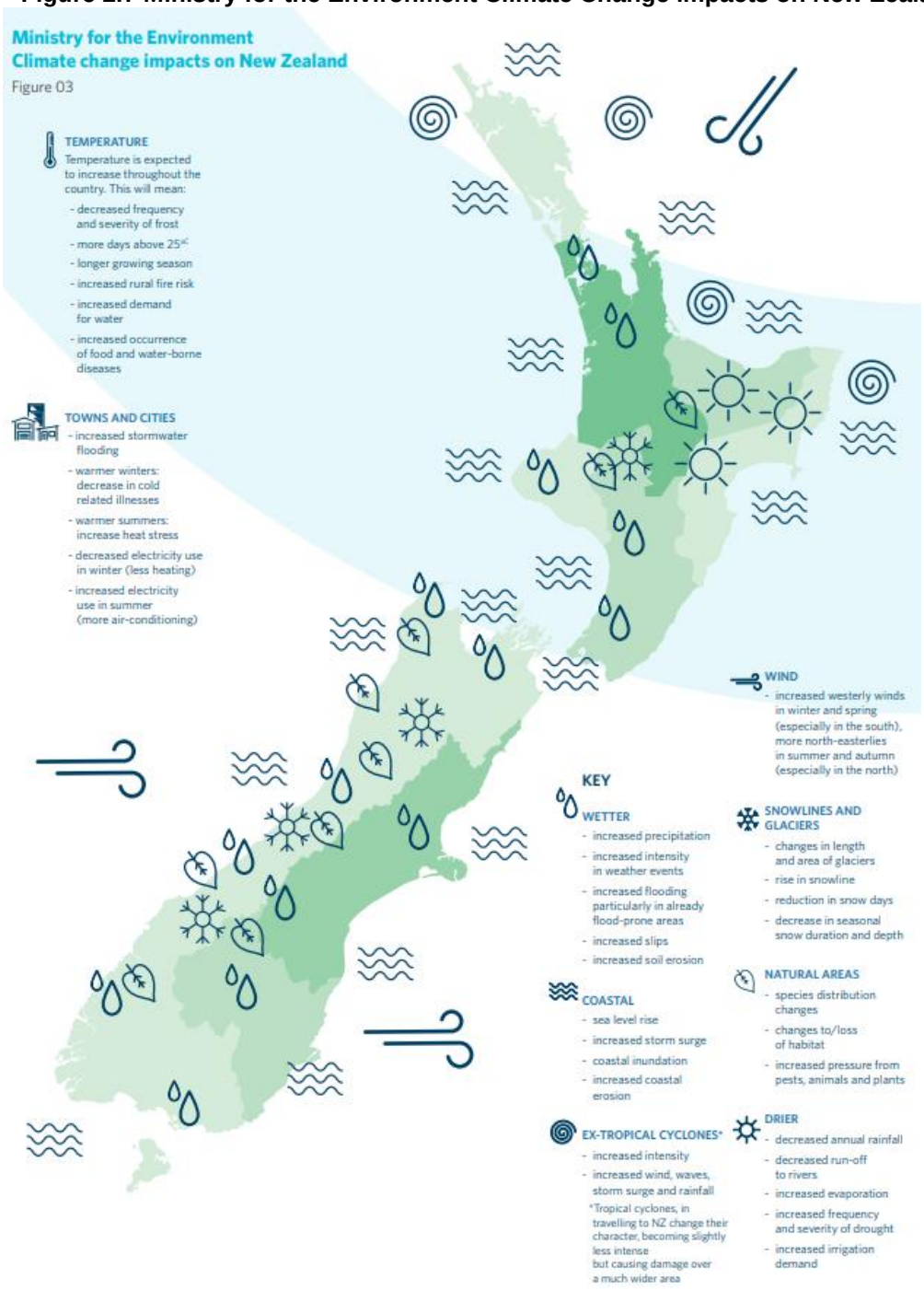
The number of people living in smaller, rural, and remote districts outside of urban areas will decline or remain the same. This includes places like Maruawai Gore. The land transport system will play a critical role in supporting the economic and social wellbeing of these communities. Public transport will also need to play a larger role in smaller cities and towns. New approaches, like on-demand shared services, will become more important.

Freight will be moved with greater efficiency and safety. The share of the freight task moved on rail and coastal shipping will also change, to support the reduction in vehicle kilometres travelled (VKT) and emissions. In towns and cities, increased home and business delivery for things like groceries and online purchases needs to be addressed. Primary producers will be looking to get products to market in faster and more economic ways.

Aotearoa is less productive than comparable countries and needs more efficient ways of doing business, like moving freight faster. The economy is slowly shifting towards service industries and will require primary industries, like farming and forestry, to find new ways to stay productive. There are also equity challenges, like ensuring fair pay, conditions, and opportunities. Businesses are under pressure to tackle these productivity and equity issues while also lowering their carbon emissions, as part of the country's push to reach net zero by 2050.

In Aotearoa we are significantly exposed to natural hazards like floods, erosion, landslides, and coastal inundation. Around 750,000 New Zealanders, and 500,000 buildings worth more than $145 billion, are near rivers and in coastal areas already exposed to extreme flooding.[2] There are also several major urban centres, taonga, and sites of cultural importance at risk. The impacts of natural hazards are felt by everyone. Climate change is making these events more frequent and severe. Even with aggressive strategies to reduce greenhouse gas emissions, the impacts of a changing climate will be felt for decades.

Figure 2.7 Ministry for the Environment Climate Change impacts on New Zealand



[2] Ministry for the Environment (2022). Managed Retreat: What it is and when it might be useful

Climate change and more frequent extreme weather events mean there are significant challenges ahead. We need to respond in different ways to build greater resilience. There will be ongoing impacts on communities and the transport networks that connect them. The transport sector will need to work with communities and infrastructure providers to adapt, including:

- identifying at-risk areas
- making plans to manage impacts
- potentially considering different approaches to rebuilding.

Together we need to find new solutions and identify long-term options that reflect the diverse requirements for urban and rural communities.

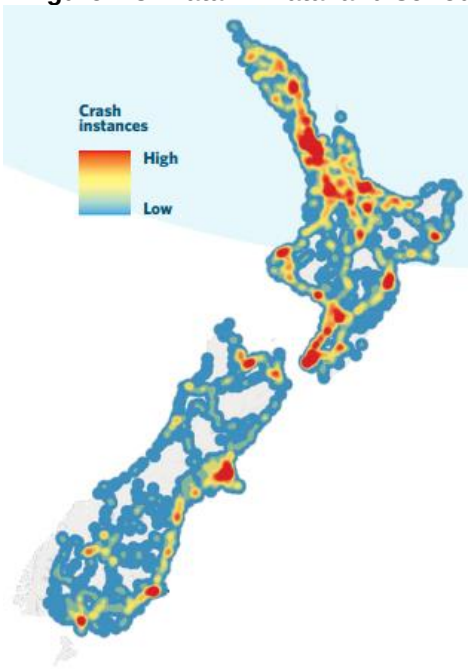
Technological innovations and shifting customer expectations will require and enable us to work in agile ways. The land transport system must be more fair and equitable, so it achieves more for everyone. We'll aim for 'win-win' solutions to grow housing supply in accessible and sustainable ways.

Transport has a strong role in making places better (placemaking) and creating communities where people want to live. It provides access to education and jobs; it connects communities to each other.

We want the land transport system to be safer and have less impact on the environment. To achieve these goals, we need to better plan and work out how we'll get there.

We must stop taking a 'predict and provide' approach to planning, where decisions about future transport infrastructure are based on projections from current trends and assumptions. Instead, we need to take a 'decide and provide' approach where we proactively plan the desired future we want to achieve, like improving safety or reducing emissions, then consistently make decisions based on what's needed to achieve these.

Figure 2.8 Arataki - Fatal and serious road crashes by region



Decision-making, especially for infrastructure, must prioritise initiatives that deliver multiple outcomes regardless of the funding source. We assess when interventions are needed and sequence them to:

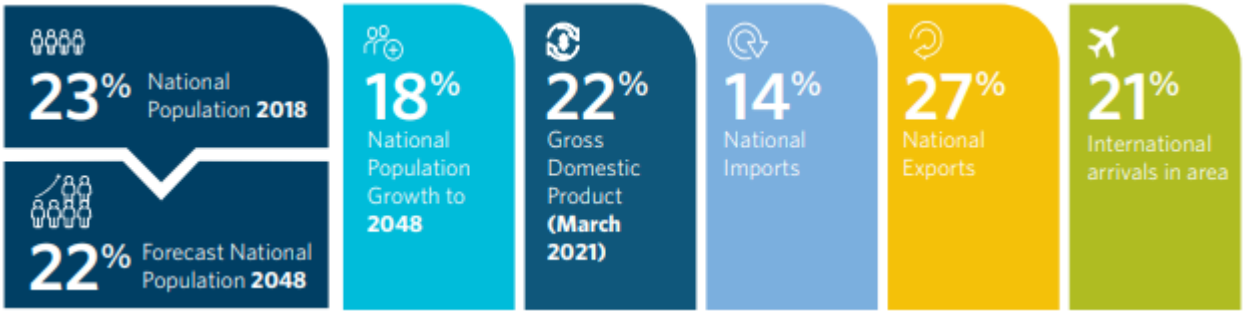
- maximise value over the whole-life cycle
- rebuild in smarter ways
- use cross-government funds effectively.

Disruption from climate change should be managed through adaptive and timely responses. The way the land transport system is planned, operated, and managed will increasingly respect and integrate Te Tiriti and Te Ao Māori

Te Waipounamu South Island - Pan Regional Summary

The South Island is an important contributor to the New Zealand economy, contributing $71.9 billion or 22% to GDP in 2020. It is a large producer of high-volume and value dairy products, vegetables, grains, fruits, logs, processed wood products, minerals, aggregates, seafood, livestock and meat, wine and general freight. Dairy is particularly strong in the Southland region. Tourism in general is also significant across the South Island.

Figure 2.9 South Island Summary



The most significant drivers of change for strategic networks in the South Island over the next 30 years are:

- increasing travel demand from population, economic growth, and tourism
- urgently and dramatically reducing transport emissions
- improving resilience to the impacts of climate change
- addressing unacceptable safety, health, and resilience deficiencies
- addressing unacceptable impacts of network conflicts, including conflicts between movement and place outcomes.

Figure 2.8 Map of current strategic network in the South Island

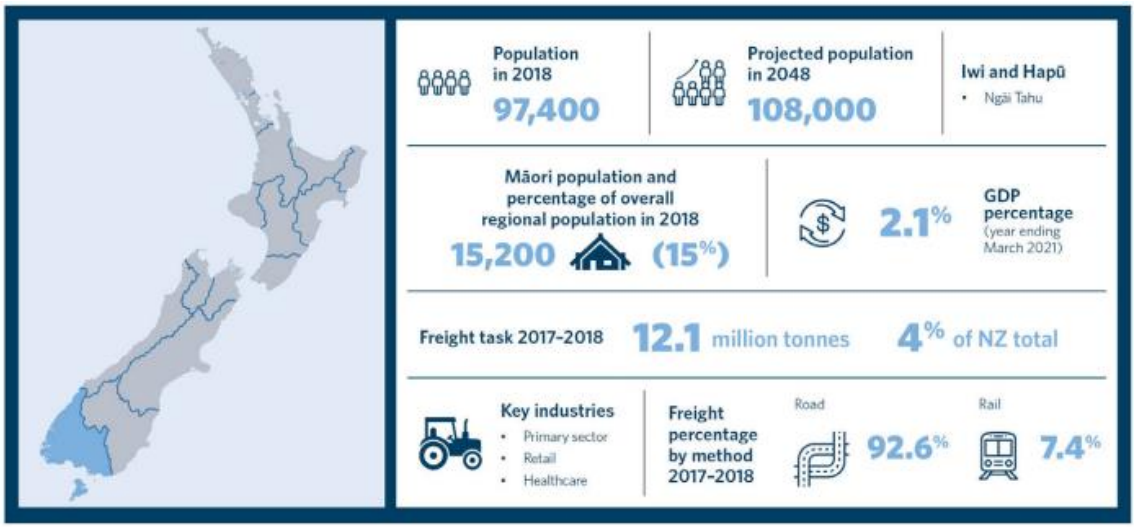


Southland has not reached any triggers and preconditions for a change, and so have not been incorporated into the potential areas of transformational change. New areas of transformational change will be added as key drivers change, and preconditions and triggers are met.

The lower South Island Otago – Southland technical advisory group had one workshop with the Waka Kotahi for Future Network Planning Project. It was highlighted in this meeting that there is a fundamental movement and place conflict between existing infrastructure and the desire for the central city.

Arataki[3]: Regional Direction Murihiku Southland March 2023

Southland Today and Tomorrow



The Murihiku population is projected to grow modestly, which means little urban development pressure in Waihōpai and the wider district. By 2048, residents aged over 65 will constitute 27%, higher than the national average, emphasizing the need for good access to keep them socially connected. The Māori population in Murihiku is 15%, lower than the national rate 16.5%, most Māori live in Waihōpai where they make up 18% of the City's population, with Ngāi Tahu as the predominant iwi.

The region's economy relies on state highways, local roads, and rail connections for moving goods. Employment growth is expected in core primary sectors, retail, and healthcare. Waihōpai serves as the main urban center, providing essential services, while South Port in Motupōhue Bluff plays a significant role as the seventh largest port in the country.

Freight movement accounts for 4% of the country's total, primarily transported by road (92.6%) and rail (7.4%). Key primary sector commodities include coal, meat, milk, and wool. Despite limited population growth, the region's economy will undergo significant changes during the country's transition to a low-carbon future.

Murihiku faces challenges due to the aging population and the need for improved infrastructure and services. Climate change adds further complexity. To address these challenges efficiently, small-scale projects, better infrastructure utilization, and climate adaptation strategies should be employed. However, achieving key goals will require more investment from various funding sources.

In conclusion, the Murihiku focus is on sustainable economic transformation, safety improvements, and accessibility, while dealing with an aging population and climate change impacts. Efficient project planning and exploring new funding sources are essential to progress towards transport outcomes successfully.

Environmental sustainability

[3] Arataki Regional Direction Murihiku - Southland March 2023

Murihiku needs to reduce transport emissions to meet government targets of the Emissions Reduction Plan by 2035 and achieve net-zero emissions by 2050. To do this, Murihiku must focus on integrating land-use and transport effectively to reduce the need for travel, shorten trip lengths, and promote alternative modes of transportation. The goal is to decrease light vehicle kilometres travelled (VKT) by approximately 5% to meet national emission targets. Although no urban areas in Murihiku require a Tier 1 or 2 reduction program, efforts should still be made to explore opportunities for VKT reduction and contribute to emissions reduction.

To meet national emission targets, Murihiku must make a modest but important contribution by reducing light vehicle kilometres travelled (VKT) by around 5%.

Healthy and safe people

Continuing to realise safety plans and supporting dramatic changes to encourage walking and cycling will help the urban areas of Murihiku.

Murihiku needs to address safety issues in Waihōpai Invercargill, surrounding areas, and high-risk rural roads, focusing on:

- run-off road and head-on crashes
- crashes at intersections
- speeding
- crashes involving vulnerable users (cyclists and pedestrians).

Efforts to improve road safety align with the Road to Zero: New Zealand's Road Safety Strategy 2020–2030 and regional safety strategies.

The region faces low rates of walking and cycling due to incomplete networks, leading to health issues like obesity and diabetes, particularly affecting certain demographics. Vehicle tailpipe pollutants have more significant health impacts, especially on vulnerable populations.

Improving safety and encouraging active transportation will support environmental sustainability and inclusive access. Expanding safe walking and cycling facilities will promote healthy and sustainable travel choices, while reducing deaths and injuries for vulnerable road users.

To enhance urban areas, Murihiku must implement safety plans and invest in new approaches to planning, design, and delivery, focusing on walking and cycling promotion. Significant investment is necessary to accelerate progress.

Inclusive access

The region's transport system struggles to provide safe, sustainable, and reliable access for people of all ages and income levels to social and economic opportunities. Heavy reliance on private vehicles creates challenges, limiting participation for those without easy access to cars, putting financial strain on households, and restricting travel choices.

Regional and rural communities need access to key centres like Waihōpai Invercargill and Ōtepoti Dunedin for education, employment, and essential services. As the population ages, there will be an increased need for accessing health services and less for education and employment.

The region's transport system struggles to provide people of all ages, abilities, and income levels with safe, sustainable, and reliable access a wide variety of social and economic opportunities.

Emerging technologies, like on-demand shuttles, could offer shared-transport options, benefiting smaller towns and rural communities and improving access to services in Waihōpai and Ōtepoti.

Access to high-quality data and information is vital for better managing the transport system and optimizing existing infrastructure.

Improving inclusive access can align with other outcomes, such as enhancing travel choices and reducing car dependency. However, trade-offs may arise, requiring careful consideration to balance emission reductions without unfairly impacting lower-income families.

Economic prosperity

Future trends, including the number of international visitors, remain uncertain for the region. However, access to Piopiotahi Milford Sound and Tāhuna Queenstown will likely remain a focus. The Milford Opportunities Project aims to manage future visitor management in the area.

Transport's role is crucial in supporting the transition to a low-emissions economy as per the Climate Change Response (Zero Carbon) Amendment Act. The region's large network is essential for freight, but its affordability depends on the performance of primary industries.

With slow regional growth and an increasing number of people on fixed incomes, local governments will face pressure to maintain infrastructure and provide services. The impacts of climate change add further challenges, including increased maintenance and renewal of assets.

Technological changes, like remote work and automation, will impact travel demand and the regional economy. Transport planning must be flexible to adapt to these uncertainties and changes in job types and locations.

Economic productivity and business competitiveness in the region can be improved by a transport system that provides:

- a range of travel options with wide capacity
- reliable journey times
- safe and low-cost ways of getting around.

Resilience and security

In the next 30 years, Murihiku will face increased risks to road and rail networks due to climate change impacts such as increased rain, storms, erosion, flooding, and landslides. The region's coastal roads and low-lying areas around Motupōhue Bluff will experience flooding and erosion, but overall, Murihiku has fewer resilience issues compared to other regions.

One major challenge is a coastal section of SH1 where high tide flooding affects traffic lanes, particularly freight access to South Port. Inland routes, like the road to Piopiotahi Milford Sound, will also be affected by extreme weather events and natural hazards, including the Alpine Fault.

Maintaining existing assets and focusing on access and connectivity is essential for resilience. Investment in maintenance and renewals can lead to multiple positive outcomes but requires changes in practices and increased funding.

To ensure resilience, the transport system must be adaptable to uncertainty and rapid change. Recent experiences with e-bikes, social distancing during the pandemic, and fluctuating fuel prices highlight the need for more flexible road space management, improved walking and cycling facilities, and reduced dependency on fossil fuels.

Focusing our Efforts

For efficient and effective progress, transport challenges in the region must be tackled in a cohesive way. The directions below identify the most important issues to be resolved over the next 10 years to make progress towards transport outcomes.

- Begin to reduce vehicle kilometres travelled (VKT), focusing on Waihōpai Invercargill, in a way that's fair, equitable, and improves quality of life.
- Enable and support the transition to a low-carbon economy.
- Maintain and improve the resilience and efficiency of interregional connections to the north and south.
- Improve access to social and economic opportunities, especially by public transport, walking, and cycling.
- Significantly reduce the harm caused by the transport system, especially through improved road safety and reduced pollutants dangerous to health.
- Support, enable, and encourage growth and development in areas that already have good travel choices and shorter average trip lengths.
- Rapidly accelerate the delivery of walking and cycling networks, predominantly through reshaping existing streets, to make these options safe and attractive.
- Explore the potential for new and emerging technologies, such as on-demand services, to improve access to social and economic opportunities.
- Better understand the impact of future economic transformation on travel patterns and freight volumes.
- Explore opportunities to move to a more multimodal freight system with greater use of rail and coastal shipping.
- Continue involvement in the Milford Opportunities Project to encourage resilience, tourism, safety, and mode shift for the Milford corridor, and surrounding region.
- Confirm how resilience risks will be addressed over time, and work with communities to plan for when to defend, accommodate, or retreat.
- Continue to implement road safety plans and programmes including those focused for iwi Māori.
- Improve or maintain, as appropriate, physical access to marae, papakāinga wāhi tapu, and wāhi taonga.

These will be updated over time to focus effort on the most critical matters

2.2.4 One Network Framework (ONF)

Traditionally, roads and streets are considered as movement corridors only to get us from A to B.

Many of our roads are constrained by existing infrastructure, we need to consider how these roads can meet growing demand.

A new approach to classify our transport networks has been created that enables better design, planning and delivery of a modern transport system to meets the increasing needs of people, businesses, communities and our climate.

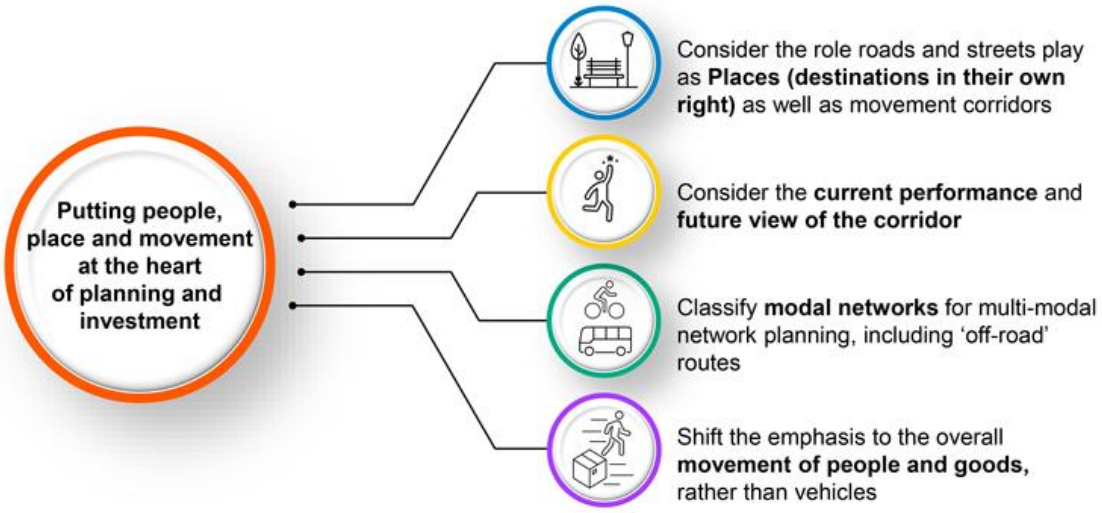
The One Network Framework (ONF) recognises that streets not only keep people and goods moving, but they're also places for people to live, work and enjoy. The ONF is designed to contribute to improving road safety and build more vibrant and liveable communities.

Movement and Place has many uses at the strategic network planning and development level, as well as at the detailed project level.

It marries network-wide and local considerations. At its heart, the ONF organises transport links by their place and movement roles into road and street types.

The ONF is a tool to help establish network function, performance measures, operating gaps and potential interventions for each road and street type.

Figure 2.5 Putting People, Place and Movement in Planning and Investment



The ONF classifies the transport network into street categories which bring together movement and place elements of a road or street.

Figure 2.6 Street Categories

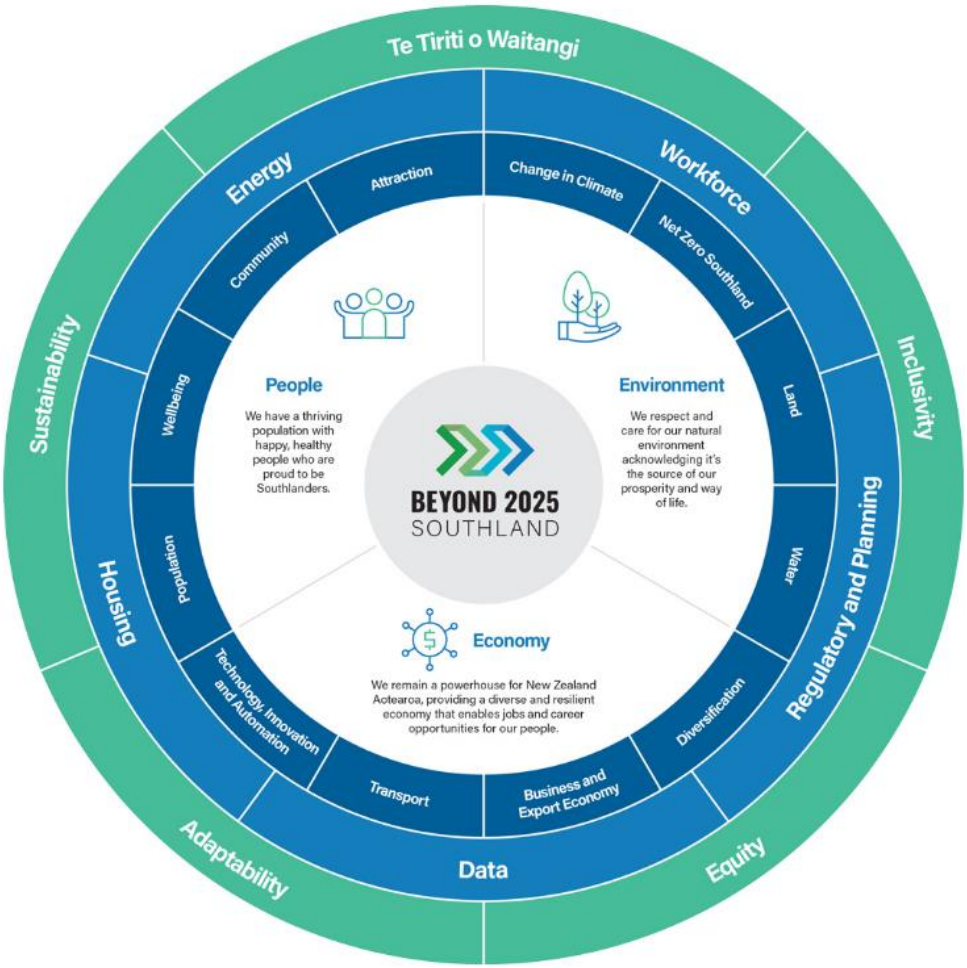


2.3 SOUTHLAND REGIONAL CONTEXT

2.3.1 Beyond 2025 Southland – Regional Long Term Plan

Beyond 2025 Southland is the long-term planning workstream within Southland's Just Transition work plan and the updated Southland Regional Development Strategy 2015-2025 (SoRDS).

The Plan aligns regional development aspirations with enabling rules and the broader context. It aims to achieve our identified goals for people, environment, and economy, with four key sections: Key Enablers, People, Economy, and Environment. Enablers are vital and given priority. Each section includes recommendations and guiding principles, including Te Tiriti o Waitangi, inclusivity, equity, adaptability, and sustainability. The circle diagram illustrates our integrated and interconnected approach.



The plan, which builds on the previous work of the Southland Regional Development Strategy (SoRDS), has 16 work streams within five areas of focus.

The transport work streams focus is to ensure the region's transport system (road, rail, air and sea) enables and supports regional growth and wellbeing, while understanding and planning for new opportunities and challenges.

Resilient Transport System

Economic prosperity relies on resilient and integrated transport systems across all modes. Recent upgrades, like the Stead Street stop bank and the petroleum berth at South Port, have enhanced protection and seismic resilience.

A significant challenge is funding the extensive roading and bridging network with a small ratepayer base, leading to underinvestment, higher transport costs, and increased emissions.

Rural councils seek a fair share of funding from Waka Kotahi to support sustainable, long-term planning, and asset management aligned with climate change and decarbonization goals. They advocate for reviewing road user charges and funding assistance rates to reduce the local share.

The Regional Land Transport Plan 2021-2031 guides the region's land transport network development, prioritizing resilience, road safety, asset condition, connectivity, and environmental sustainability.

Low Emission Transport System

Waka Kotahi acknowledges the growing challenge of low emission travel and freight options. Transport infrastructure development should align with the Southland Murihiku Regional Energy Strategy and the target of achieving net-zero carbon emissions by 2050. The recent Government announcement of $100 million for green hydrogen presents an opportunity for the region to incentivize new hydrogen projects, supporting the goal of having 60% of heavy vehicles powered by renewable energy by 2050.

Growing our Freight Capability and Capacity

Our economy relies on export-focused businesses producing high-value time-sensitive products that require efficient freighting. Challenges include emerging industries with unrealized potential, limited direct air freight from Waihōpai Invercargill, and a significant reliance on road transport, leading to maintenance and safety concerns. Utilizing the underutilized main trunk rail line for freight to South Island destinations is an opportunity.

South Port's channel deepening will improve supply chain efficiencies, and Invercargill Airport aims to increase flights and capacity, benefiting tourism and airfreight for produce, especially aquaculture.

Investigating intermodal freight and distribution facilities to meet future industry needs and considering an integrated approach to all modes of transport is vital. Aligning the region's approach with national and global freight strategies is also crucial.

Next Steps:

Advocate

For a national sustainable long-term planning, financing and funding model for land transport which aligns with and considers asset management best practice, climate change and decarbonisation.

For more equitable allocation of funding for roading and rail in Murihiku Southland including an increase in the FAR for rural councils to reduce local share levels.

Recommend

Investigation into the development of intermodal freight and distribution facilities to service future industry requirements.

The consideration of implementation of recommendations regarding low emissions transport in the Southland Murihiku Regional Energy Strategy and Net Zero Southland Reports alongside existing strategies such as the Regional Land Transport Plan

That there is a review of the Southland Integrated Transport Strategy 2005 to ensure alignment of all transport modes and future freight requirements.

2.3.2 Regional Land Transport

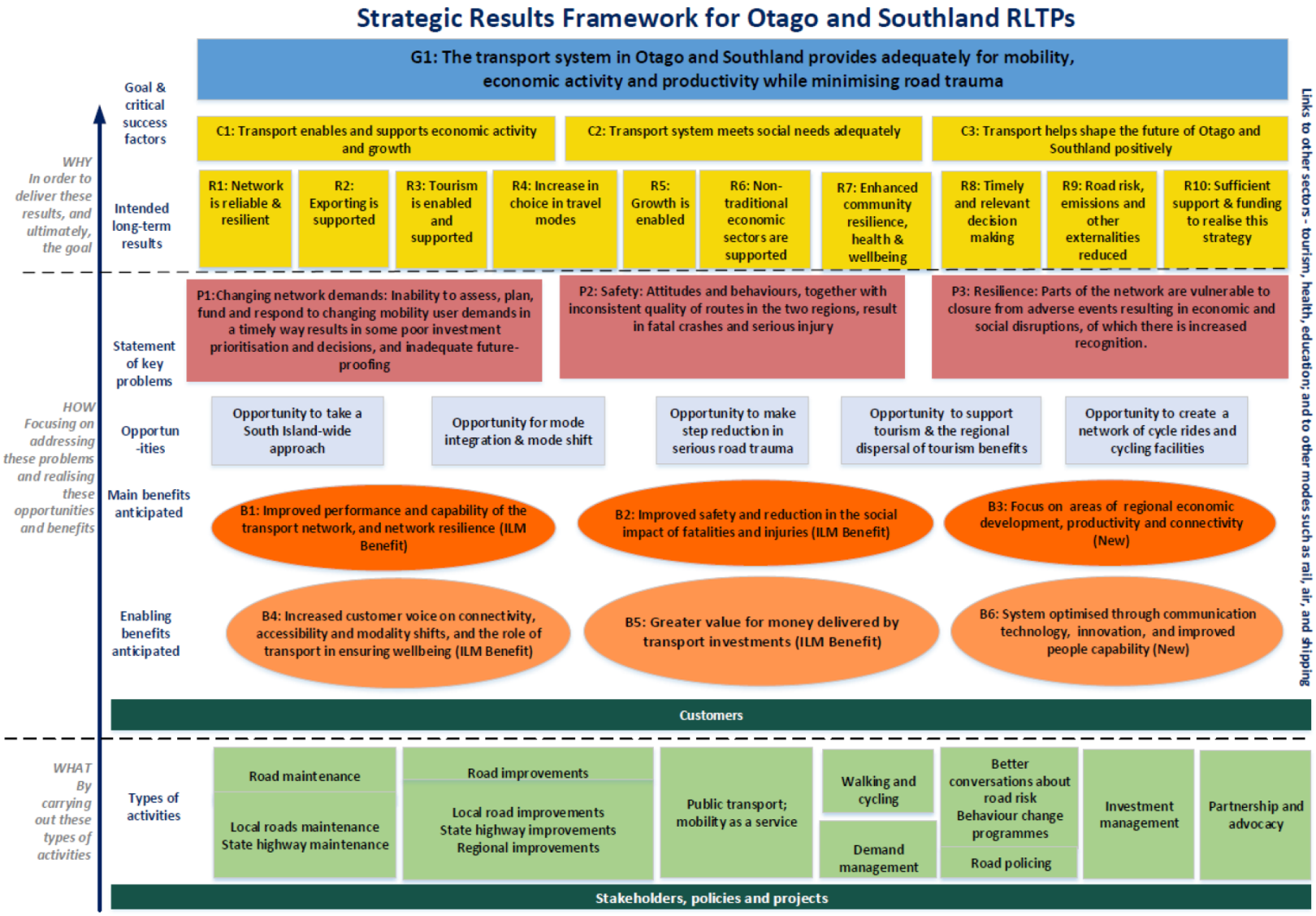
The Otago Regional Council and Environment Southland have produced a joint Strategic Results Framework which forms part of their Regional Land Transport Plans.

The framework sets out:

- What types of activities / projects that approved organisations and the RTCs themselves should be carrying out.
- How we should do this (e.g. by concentrating on addressing certain problems and realising certain benefits, in the way that the business case approach requires).
- And why – identifying the results this work is intended to achieve.

The following figure summarises the framework sets out both the short-term focus (the problems and benefits to be addressed in the next three or so years) and the longer-term results sought. At the base of the strategic results framework are the types of activities that will feed into the main outputs and outcomes. It is intended that undertaking these activities will lead to the key outcomes and objectives being achieved and the problems addressed.

Figure 2.8 Joint Strategic Results Framework[4]



[4] Needs update with 2024 release

2.4 INVERCARGILL CITY CONTEXT

2.4.1 Invercargill Today

Invercargill is a vibrant City the commercial centre for the Southland region. It has an estimated population in 2023 of 57,100. The region is not expected to have significant population growth but has the capacity in its infrastructure currently to satisfy a population of at least 60,000 or more. Its land area is around 49,000 hectares and includes the city, surrounding rural land and the port township of Bluff.

It extends from Makarewa in the north to Bluff in the south, Kennington in the east and Oreti Beach in the west. The city is flat with parts near the coastline being low-lying, particularly near the New River estuary.

2.4.2 Transport System Overview

The Invercargill roading network consists of 295 km of urban sealed roads, 302 km of rural roads with about 123 km of the rural road being unsealed roads. Council provides and manages 55 bridges, 500 km of footpaths (including off road cycle lanes) along with streetlights, 6 off street carparks and 740 parking spaces with 92 parking kiosks within the CBD of the City.

Road networks are generally formed on a grid layout and with relatively flat terrain, which makes mobility and accessibility easy for all modes of transport. The roading network has plenty of capacity. This ensures that travel reliability is a given for all road users.

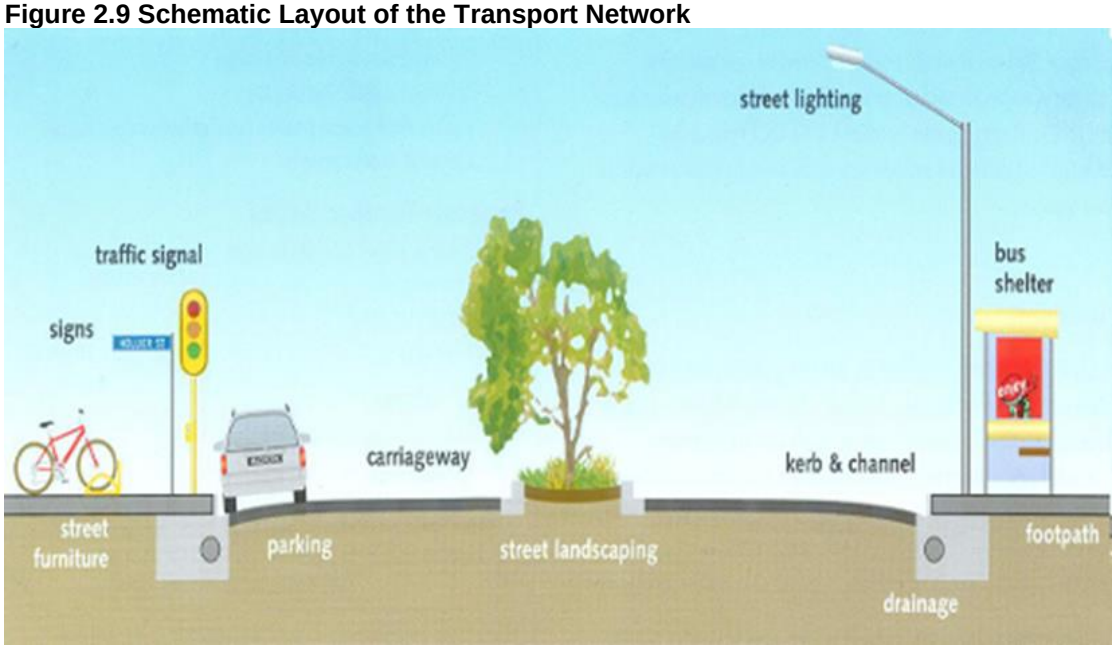
Invercargill has a cycle network across the urban city utilising mostly on road cycle lanes.

Public Passenger Transport is also provided as part of Council activities (via a delegated authority from Environment Southland in 2002) and this provides six BusSmart routes and 10 Council supported school bus services together with a service supporting Southland DisAbility Enterprises (SDE). A new network and timetable was implemented in 2021. Passenger Transport is managed via the Regional Public Passenger Plan (RPTP), it is worth investigating whether these should be combined in the future.

Transport assets have a replacement value of about $692 million, and a current value of $280 million (June 2022). The assessed annual depreciation (or consumption of the assets) is $12.3 million.

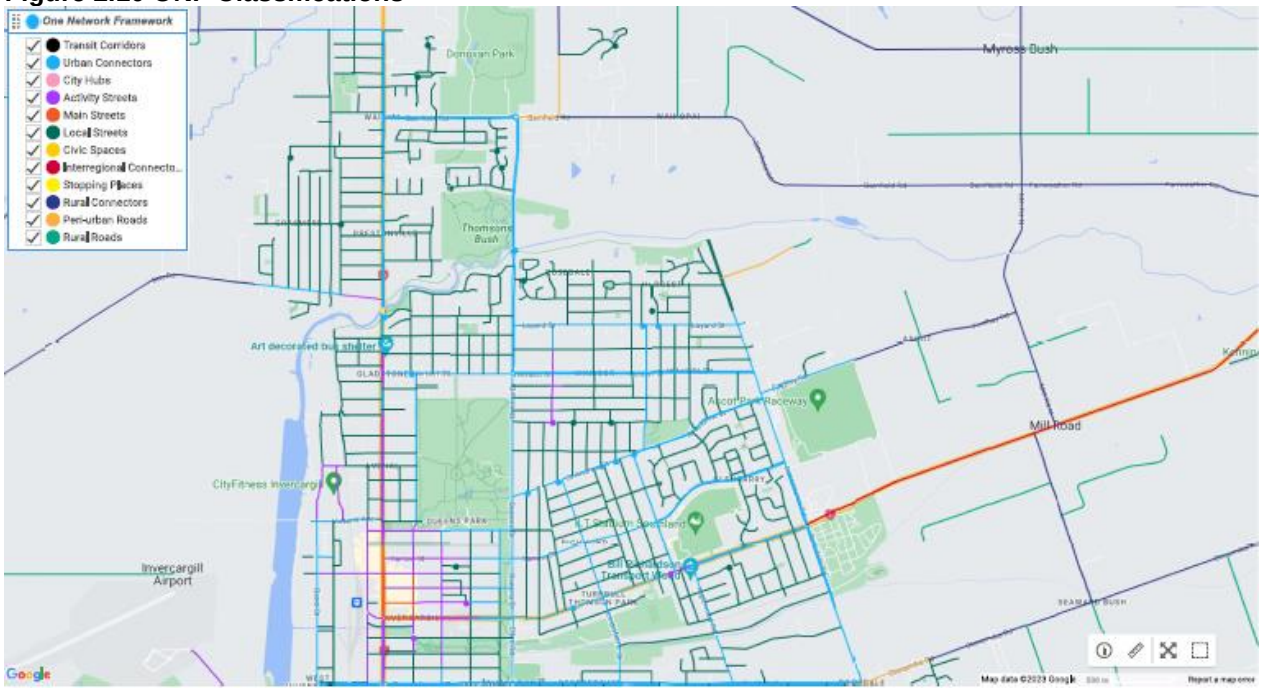
The infrastructure comprises road pavements, street lights, traffic signs and signals, footpaths, drainage, surface water channel systems, bridges, culverts, street furniture, parking facilities, vehicle access crossings and cycle tracks. The following diagram illustrates the assets that are covered by this AMP.

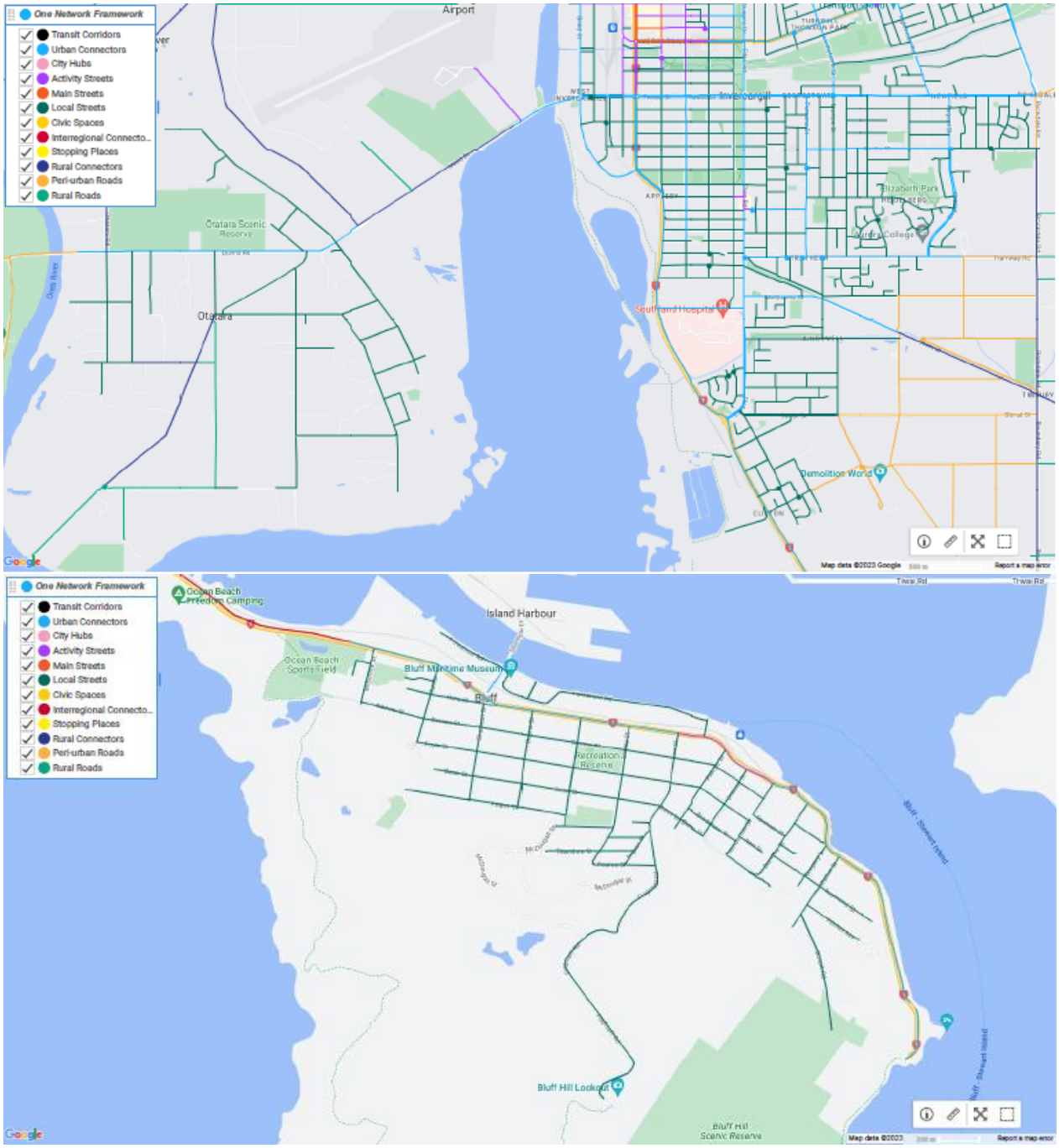
Figure 2.9 Schematic Layout of the Transport Network



A network map representing the ONF hierarchy is provided below. This shows where the varying activities are and what the use of the street should be from transport routes (with trucks moving efficiently and many cars) to streets where people have more priority and traffic is slow and active transport (walking and cycling) and play should be expected and occurring.

Figure 2.10 ONF Classifications




One Network Framework
Transit Corridors
Urban Connectors
City Hubs
Activity Streets
Main Streets
Local Streets
Civic Spaces
Interregional Connecto...
Stopping Places
Rural Connectors
Peri-urban Roads
Rural Roads
Airport
Otatara Scenic Reserve
Otatara
Oreti River
Elizabeth Park
Southland Hospital
Demolition World
Google
Map data ©2023 Google
Report a map error
One Network Framework
Transit Corridors
Urban Connectors
City Hubs
Activity Streets
Main Streets
Local Streets
Civic Spaces
Interregional Connecto...
Stopping Places
Rural Connectors
Peri-urban Roads
Rural Roads
Ocean Beach Freedom Camping
Island Harbour
Ocean Beach Sports Field
Bluff Maritime Museum
Bluff
Recreation Reserve
Bluff Hill Lookout
Bluff Hill Scenic Reserve
Google
Map data ©2023
Report a map error

2.4.3 Long Term Plan (LTP)

The Local Government Act 2002, Schedule 10 requires the development of ten-year Long Term Plans. Asset Management Plans are the foundation to providing a robust basis for the long-term forecasts and support a 30 year approach aligning and supporting the Council Infrastructure Strategy.

As part of the 2024-34 Long-Term Plan under the Local Government Act Council is developing its own Council-focused "Community Outcomes". These are best described as long-term goals or aspirations of Council for the Community, and have been derived from Council's vision:

"Our City with heart" / "He Ngākau Aroha"

The current mission:

"Waihōpai – To leave in good order"

Council has also identified the following strategic priorities for the 2024 – 2034 Long-term plan:

- Meeting the changing needs of our rangitahi as part of our wider population, which is growing older and more diverse
- Delivering city centre renewal
- Enabling the housing, health, security and social infrastructure our city needs to grow
- Navigating increasingly complex environmental challenges including climate change, land contamination and earthquake risks.
- Maintaining Community affordability in a time of economic volatility - Core infrastructure, major projects and levels of service will be delivered with financial prudence and efficiency
- Ensuring Council leadership and delivery is credible and effective, building community trust and engagement.

The transport sector also has a key issue of encouraging a stronger move to support active transport modes and a reduction in the use of cars, especially single occupancy. This will have a lasting impact on health and wellbeing and also support climate change initiatives.

2.4.3.1 Community Outcomes

- One Community – Our youth, older people, different neighbourhoods and communities' basic needs are met, and they feel valued and proud to live here.
- A vibrant, safe city centre which meets our people's diverse cultural needs.
- A future focused economy delivered through innovation and partnership and supported by appropriate infrastructure.
- A healthy, resilient environment where the city is well positioned to navigate climate change.

The transport activity contributes to the achievement of these outcomes as shown in the next table.

Table 2.2 How Roading Contributes

Council Community Outcome	How the Road Activity Contributes
One Community – Our youth, older people, different neighbourhoods and communities' basic needs are met, and they feel valued and proud to live here.	Corridor management contributes to public events by having safe roads and pedestrian access.
	Street lighting allows residents to feel safe at nights.
	Safe roads allow freedom of movement for residents including appropriate lighting.
A vibrant, safe city centre which meets our people's diverse cultural needs.	Roading provides roads to connect people, signs to direct, footpaths for pedestrians, and street furniture for streetscape usage.
	CBD areas which have high amenity places for people. On-Street facilities such as visitor signs, streetscape, seating, and car charging, etc. offer high value people space and have flexibility to quickly adapt
A future focused economy delivered through innovation and partnership and supported by appropriate infrastructure.	Roading provides the vital connections with state highways for the freight task distributing the goods needed for a city and throughout the city.
	Good roading management delivers a core infrastructure in leading the City.
	New innovations are investigated during the asset renewal process.
A healthy, resilient environment where the city is well positioned to navigate climate change.	Roading (pavements) contributes to accessibility, via integrated networks of connected roads and footpaths.
	Safe roads allow residents to select a mode of transport they wish to use with confidence
	Wide streets and low traffic volumes allow ease of movement, together with networks which are resilient and reliable.

The Asset Management Plan records the current and desired Levels of Service and determines the Maintenance and Capital Works Programmes and their associated budgets required to make assets meet their desired Levels of Service.

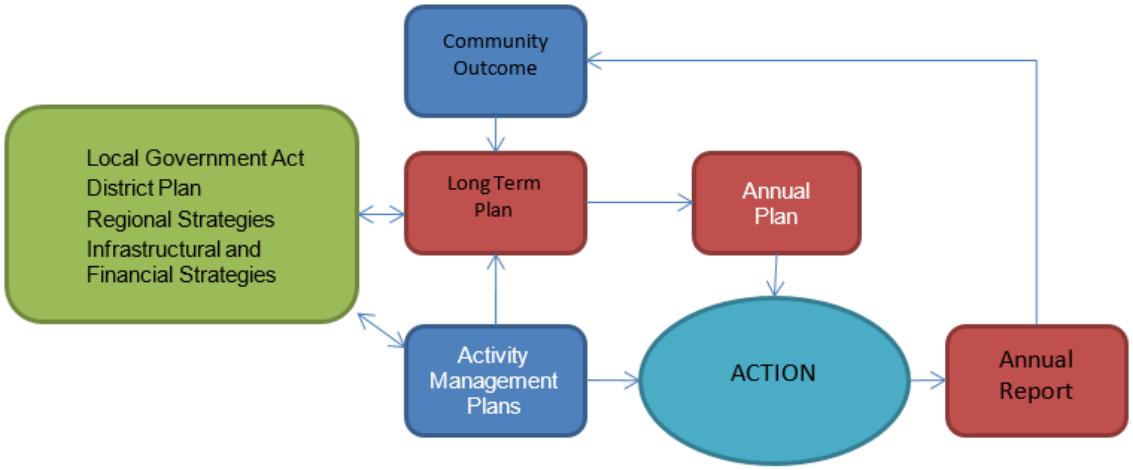
- The Long Term Plan confirms Maintenance and Capital Works Budgets that are approved by Council to meet Community outcomes.
- Asset Management Plans support and underpin the activities in the Long Term Plan. They are implemented through works programmes in asset areas. Adoption of the budgets for these programmes is carried out through the Long Term Plan process and subsequent annual plans. Changes to budgets for programmes may

occur during the consultation process and adoption of Long Term Plan budgets or annual plans.

Variations between this Plan and the most recently adopted Long Term Plan / Annual Plan are recorded in the "Table of Changes to be Incorporated in Next Review" at the beginning of this document. The consequences of any variations will be reflected in subsequent reviews of the Long Term Plan / Annual Plan.

The following diagram provides an overview of the context of this Asset Management Plan in relation to the above.

Figure 2.11 Context of Long Term Plan



2.4.4 30 Year Infrastructure Strategy

The Local Government Act (in 2014) required asset management planning to be a fundamental part of Council's prudent stewardship of community resources over the long term, and require Council to produce a 30 year infrastructure strategy for core assets. The Infrastructure Strategy is required to address:

- Identification of strategic issues and options
- Outline how infrastructure assets will be managed
- Indicative capital and operating expenditure forecasts
- Significant CAPEX decisions – cost options for each
- Assumptions on lifecycle, demand, levels of service

What can residents expect in 2054?

The Central Business District of Invercargill will be redeveloped and supported by the infrastructure needed to support strong business activity and be a vibrant space where people come to gather, rest and enjoy. Invercargill will have a City Centre which people are proud of and invite others to enjoy. It will have activities that support the use of public space and support the business hub of Southland.

Roading infrastructure will be safer and provide good reliable access to all users and continue to meet the needs of the community. Residents will be changing their travel mode of choice, with cycling and passenger transport continuing to grow. Key

infrastructure to support the wider use of low carbon travel modes will be in place and be accepted in the community. Industry will have addressed freight movement and adopted technology which is sustainable.

Strategic responses in the 2023 Infrastructure Strategy are:

1. Maintain our current asset base – We will be responding to priorities and challenges in a strategic manner.
2. Renew assets at the rate of asset consumption – As set out in the Financial Strategy.
3. Focus on asset criticality – replacing critical assets before failure.
4. Plan and invest for resilience for critical assets
5. Design pipe network renewals to accommodate understood impacts of climate change.
6. Focus on sound evidence-based activity decision making.
7. Better understand and meet our community's needs, through consultation and delivery of agreed levels of service.
8. Ensure a viable competitive supplier market exists and is maintained in the region.
9. Strengthen asset management processes, tools, data and expertise.
10. Deliverability – recognise a large capital package for Council and detailed forward planning will be required to ensure suitable and adequate resource availability.

2.5 STRATEGIC ASSESSMENT

The principal objectives of the roading activity are:

- To provide a safe road environment.
- To provide an efficient, effective, reliable and resilient integrated road network for all modes of transport.
- To support a change to active mode transport environment where use of cars is reducing.
- To be able to demonstrate that services that are delivered are value for money.
- To provide and support access in the community (via Passenger Transport, Total Mobility) and for vulnerable users.
- To invest appropriately to demonstrate that the assets are managed in a fiscally prudent manner for current and future generations.
- Comply with statutes and regulations relating to territorial local government.

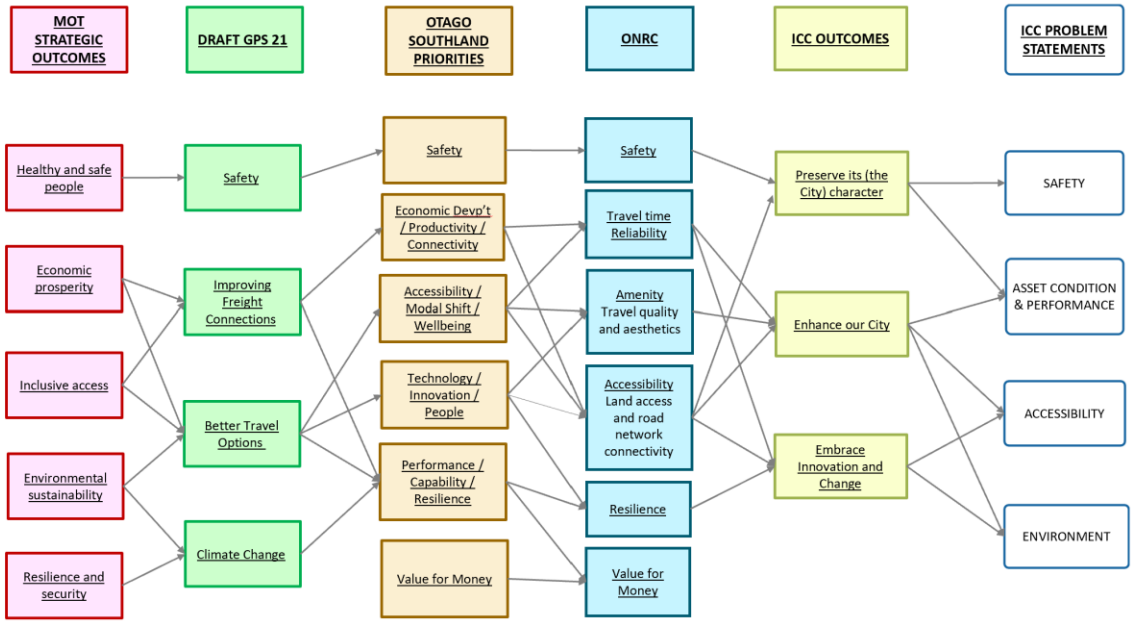
Achieving these objectives means delivering the investment benefits associated with the proposed programmes in this AMP.

2.5.1 Alignment with Strategic Context

This Plan looks to align with the Government Policy Statement for Transport (GPS2021), the One Network Framework (ONF), the Otago-Southland Regional Land Transport Plan and the ICC Community Outcomes. This is demonstrated in Figure 2.12 and Table 2.3 below. This plan will be updated when the new GPS 2024 is released.

This is a key area where Council, Community and Funders are engaged and linked via the local and national approaches.

Figure 2.12 Strategic Alignment[5]



[5] Needs updated – Waiting on RTC and New GPS

Table 2.3 Alignment of Objectives

Ministry of Transport Outcomes Framework	GPS 2021 – assumed no major changes 2023	Southland Otago Regional Land Transport Plan 2021	Waka Kotahi One Network Framework	Invercargill City Council Community Outcomes	Roading Asset and Transport Activity Priorities
Healthy and safe people Protecting people from transport-related injuries and harmful pollution, and making active travel an attract option	**Healthy and safe people** Protecting people from transport-related injuries and harmful pollution, and making active travel an attract option	**Road Safety where Otago and Southland continue to be disproportionately represented in New Zealand's poor road safety statistics**	**A land transport system that is safe, sustainable, efficient and effective for people and goods.**	**A vibrant, safe city centre which meets our people's diverse cultural needs.**	**Continuous improvement of road user safety** Reduction in DSI crashes, increased road safety education
Environmental sustainability Transitioning to net zero carbon emissions, and maintaining or improving biodiversity, water quality, and air quality	**Environmental sustainability** Transitioning to net zero carbon emissions, and maintaining or improving biodiversity, water quality, and air quality	**Environmental sustainability** T**ransforming to a low carbon transport system, reducing the environmental impact of transport is urgent; and being further considered by Government.**	**Roads and streets play a role as Places (destinations in their own right) as well as movement corridors**	**One Community – Our youth, older people, different neighbourhoods and communities' basic needs are met, and they feel valued and proud to live here.**	**Improved Community connectivity and social wellbeing** Increase in multi-modal use, reduction in network carbon emissions.
Resilience and security Minimising and managing the risks from natural and human-made hazards, anticipating and adapting to emerging threats, and recovering effectively from disruptive events	**Resilience and security** Minimising and managing the risks from natural and human-made hazards, anticipating and adapting to emerging threats, and recovering effectively from disruptive events	**Asset Condition** W**ith resilience issues arising across Otago and Southland due to the age and deteriorating condition of road assets**.	Classify **modal networks** for multi-modal network planning, including off-road routes	**A healthy, resilient environment where the city is well positioned to navigate climate change.**	**Contribute to economic growth and productivity** Increased freight throughput, availability of the network
Economic prosperity Supporting economic activity via local, regional, and international connections, with efficient movements of people and products	**Economic prosperity** Supporting economic activity via local, regional, and international connections, with efficient movements of people and products	**Future Focused** To e**nsure the Otago and Southland regions are ready and able to respond to change and new challenges is essential.**	Consider the **current and future network function**	**A future focused economy delivered through innovation and partnership and supported by appropriate infrastructure.**	
Inclusive Access Enabling all people to participate in society through access to social and economic opportunities, such as work, education, and health care	**Inclusive Access** Enabling all people to participate in society through access to social and economic opportunities, such as work, education, and health care	**Connectivity and Choice and the need for co-ordinated, integrated planning to improve choices for the movement of people and goods, and create real change in the way people travel, particularly to work and school.**	**Shifts the emphasis to the movement of people and goods, rather than vehicles**		

2.5.2 Business Case Approach

Waka Kotahi NZ Transport Agency use the Business Case Approach (BCA) focused on the transport industry to assist with informed decision making. This is the investment management approach for roading to be eligible for investment from Waka Kotahi, and is founded on the principles of Treasury's Better Business Case (BBC) approach.

The objectives of the BCA are:

- Enable efficiency
- Provide more confidence of investment and better value for money
- Enable quicker, more effective decisions from the NLTF

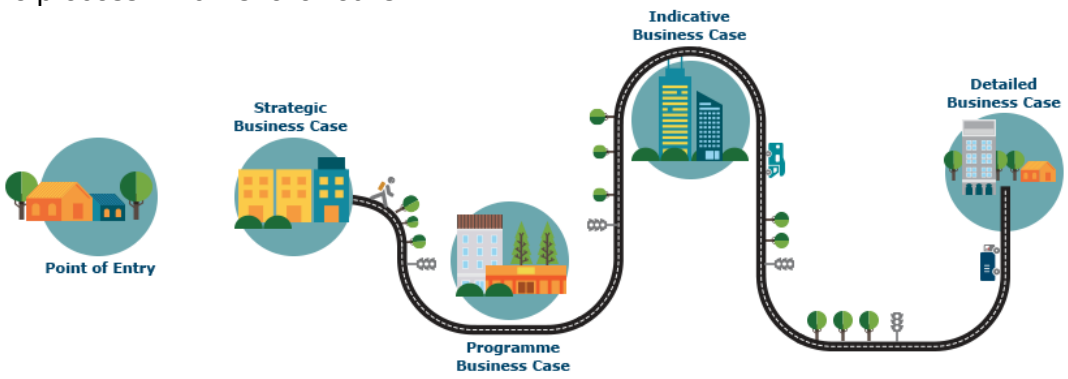
The BCA enables early decision making before committing significant resources.

The principles and desired behaviours of the BCA are illustrated below:

Figure 2.13 Principles and Desired Behaviours of the BCA

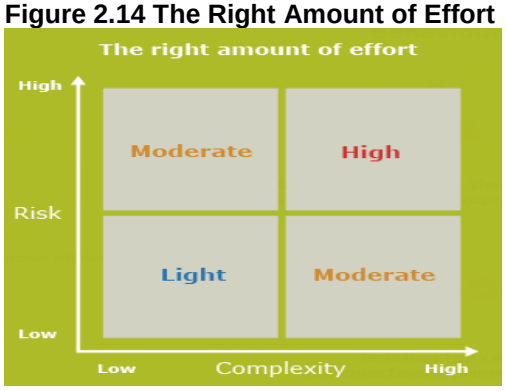


The process which is followed is:



The BCA seeks to identify the right amount of effort for the complexity of the issue as follows:

Figure 2.14 The Right Amount of Effort



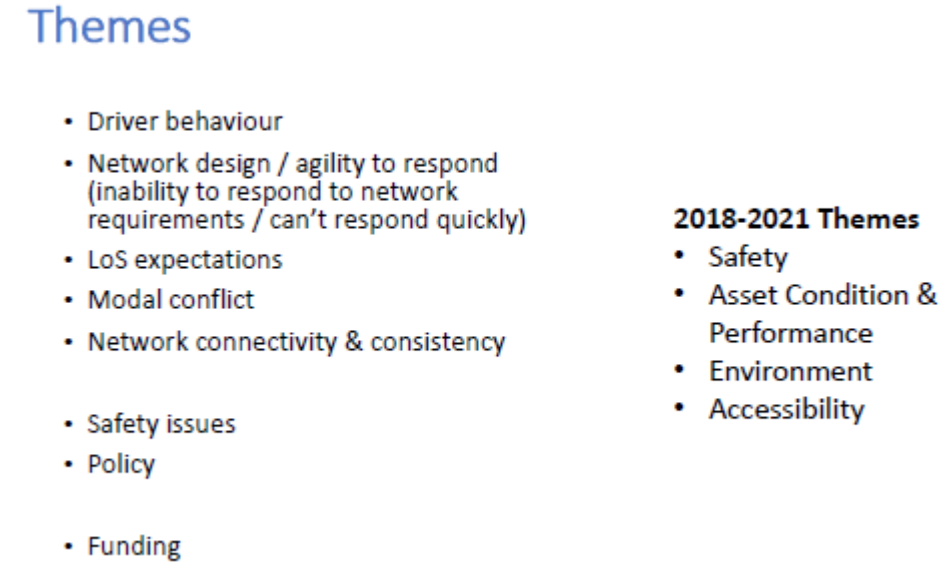
For this AMP in 2023, it is anticipated that the effort would fit between light and moderate as Council has a relatively small network, low demand levels and assets which have the capacity to meet this demand with suitable investment.

"Point of Entry" is important to be discussed with Waka Kotahi to ensure that the programme business case is fit for purpose and establishes the complexity required. The updated 2023 ILM workshop informs the Strategic Case and this Plan seeks to improve and concentrate predominantly on safety, community connectivity and wellbeing while supporting the city's economic growth and productivity.

2.5.3 Problems, Benefits and Consequences

The outputs from the Investment Logic Mapping (ILM) workshop conducted for the 2018-21 AMP were workshopped and review to ensure appropriateness for 2023. Some minor refocusing has been undertaken to refresh the problem statements in 2023. The following diagram provides the key themes in the 2018-21 workshop and the refocus of the 2023 ILM workshops.

Figure 2.15 2018 Workshop Part Two (Key Theme Analysis)



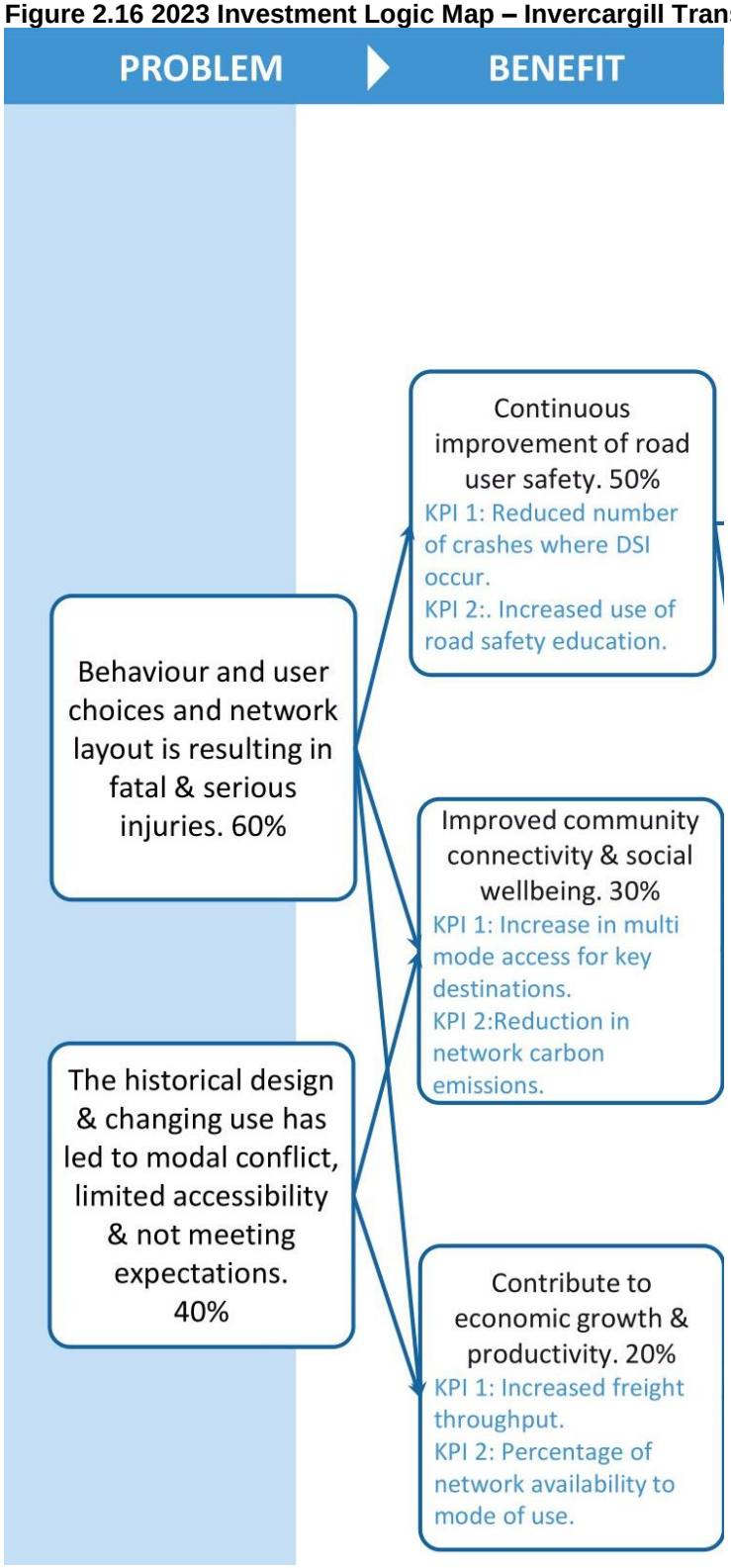
Overall, the PROBLEM (WHY) defined from the 2023 assessment are:

- Behaviour and user choices and network layout is resulting in fatal & serious injuries.
- The historical design & changing use has led to modal conflict, limited accessibility & not meeting expectations.

In terms of BENEFITS (WHAT), any investment to address these problems would primarily improve road user safety and improve community connectivity and social wellbeing. It would also contribute to the economic growth and productivity of the city.

- Continuous improvement of road users safety – 50%
- Improved community connectivity and social wellbeing – 30%
- Contribute to economic growth and productivity -20%

Figure 2.16 2023 Investment Logic Map – Invercargill Transport System



Environment Southland also convened an RTC member's workshop to identify problem statements at a regional level, as at May 2023 these being:

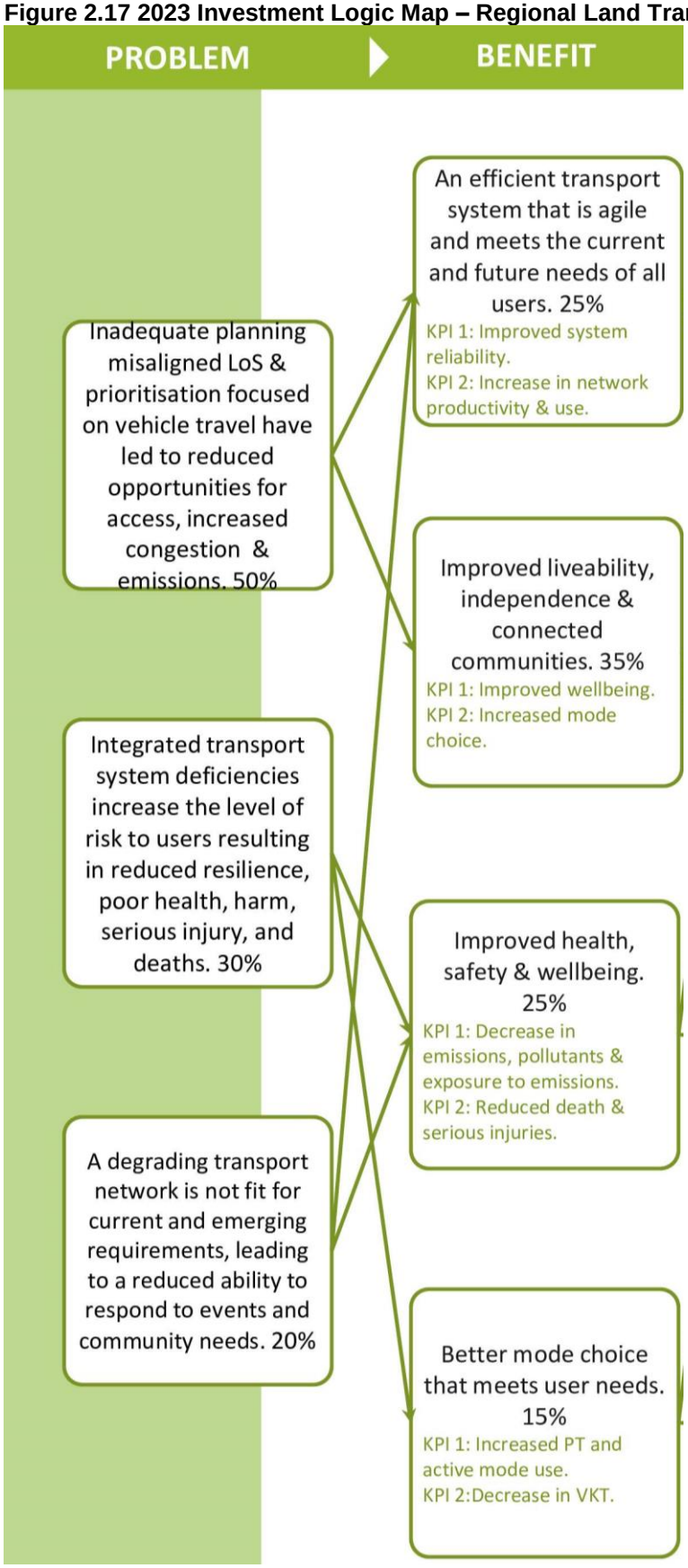
The Regional Land Transport PROBLEM (WHY) defined from the 2023 assessment are:

- Inadequate planning misaligned levels of service and prioritisation focused on vehicle travel have led to reduced opportunities for access, increased congestion and emissions
- Integrated transport system deficiencies increase the level of risk to users resulting in reduces resilience, poor health, harm serious injury and deaths.
- A degrading transport network is not fit for current and emerging requirements, leading to a reduced ability to respond to events and community needs.

In terms of BENEFITS (WHAT), any investment to address these problems would primarily improve road user safety and improve community connectivity and social wellbeing. It would also contribute to the economic growth and productivity of the city.

- Improved liveability, independence and connected communities - 35%
- An efficient transport system that is agile and meets the current and future needs of all users – 25%
- Improved health, safety and wellbeing – 25%
- Better mode choice that meets user needs. – 15%

Figure 2.17 2023 Investment Logic Map – Regional Land Transport



2.5.5 Desired Outcomes

Addressing the above problems should both contribute to achievement of the community outcomes and achieve benefits related to the problem statements.

Figure 2.17 defines the KPIs and measures for these benefits.

Figure 2.18 Regional ILM Benefit and Responses

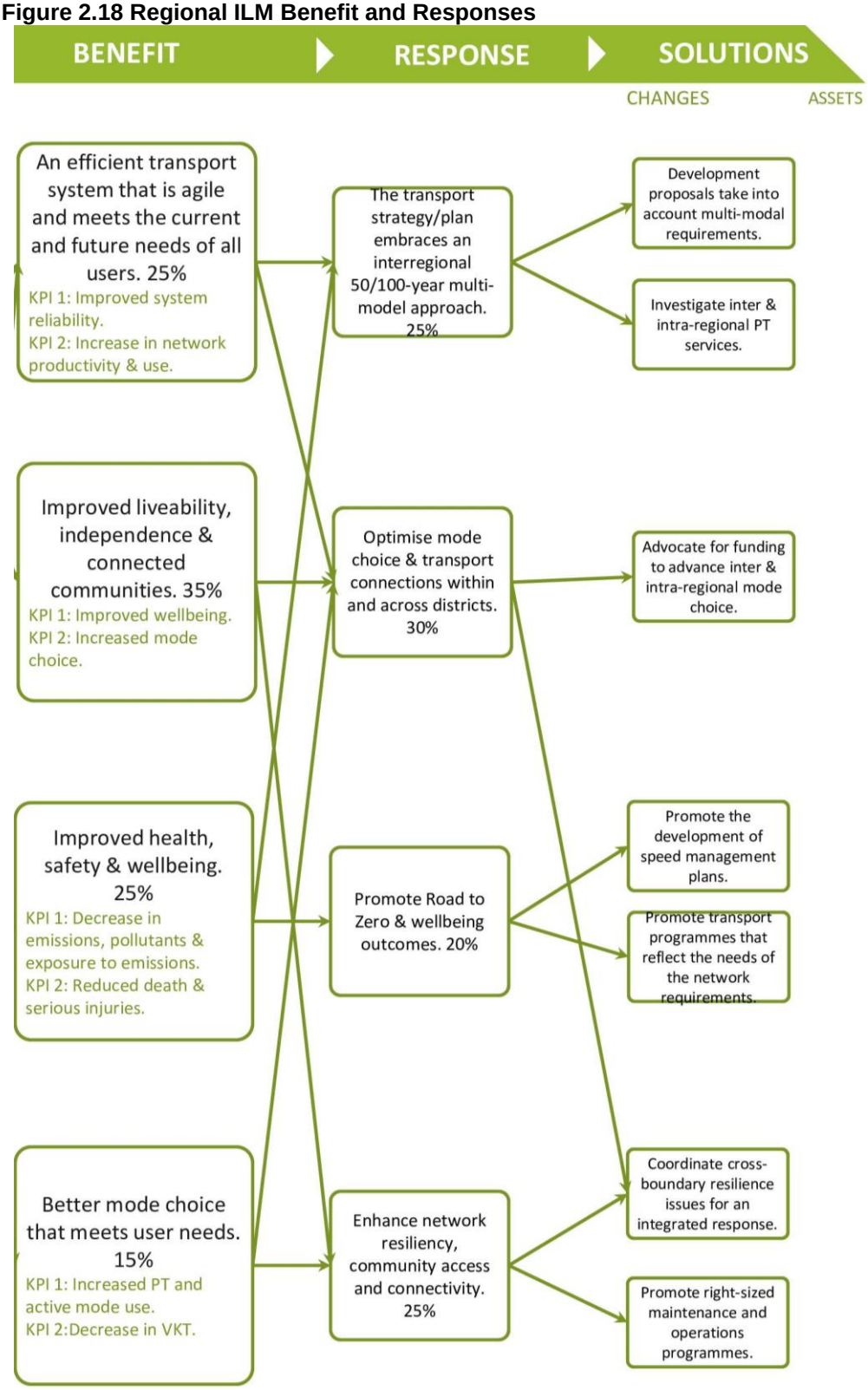
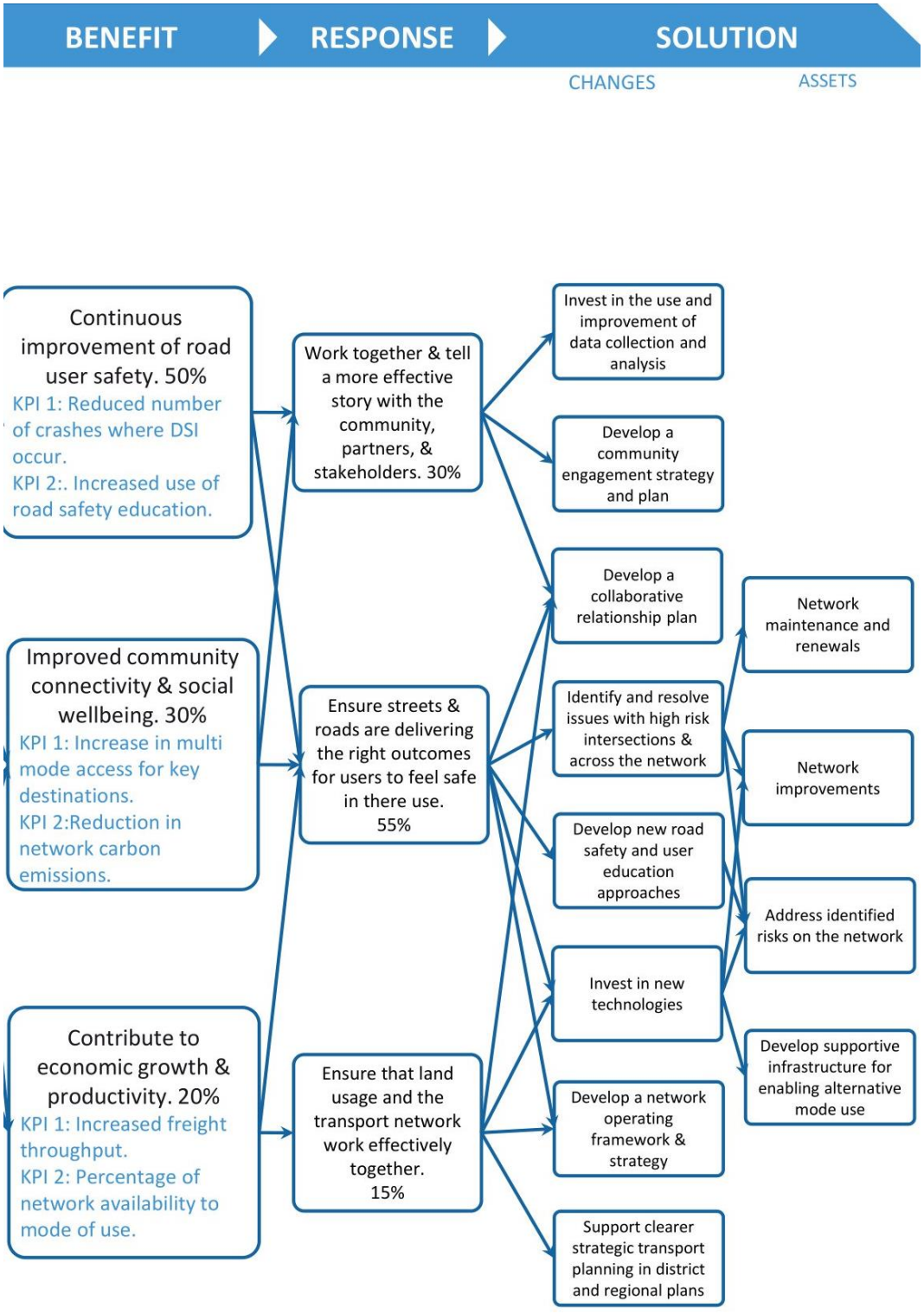


Figure 2.17 ILM Benefits Map (2023)



2.6 THE EVIDENCE BASE

This section provides an assessment of the current state, with particular reference to the investment being sought in the Programme Business Case (PBC). Council does not have significant major capital investments for transport to address growth.

Information has been derived from the following sources and more detailed evidence is provided in Section 7 Managing our Activity (Programme Business Case) as appropriate to the various asset classes:

- ONF Performance Measures Reporting Tool (PMRT)
- TIO expenditure history comparisons
- Communities at Risk Register (Appendix 2)
- CAS and Waka Kotahi Safety Network Tools

2.6.1 Safety

Improving safety is an important goal for New Zealand, the Government having set a “Road to Zero” intermediate target of 40% reduction in deaths and serious injuries (DSI) between 2019 and 2030.

Invercargill has been over represented in crashes and poor safety for vulnerable users for many years and has demonstrated high risks in national representations.

Invercargill trends for DSI and road crash types and factors are summarised below in Figure 2.18.

These represent rankings across all local authorities in New Zealand, from 1 = Worst to 71 = Best.

While Invercargill is near the median across all DSI at 21, it is now the worst in the country for intersections. Cyclists and pedestrian crashes have improved slightly from being worst in New Zealand to 5 and 27 respectively and is still a cause for concern. Older road users and distracted drivers are of increasing concern ranking 4th and 11th worst respectively.

Communities at Risk for Invercargill

Figure 2.18 6-Years Crash Trends

	2017	2018	2019	2020	2021	2022	ICC 6-year Trend	Peer Group Analysis 2022
All deaths and serious casualties	47	31	28	29	29	21	Worsening Trend	2nd Worst out of 8
Young drivers (aged 16-24yrs)	26	21	8	13	13	18	Worsening Trend	1st Worst out of 8
Alcohol and/or drugs	49	36	37	33	22	29	Improving Trend	2nd Worst out of 8
Speed (too fast for the conditions)	60	60	44	41	44	26	Worsening Trend	2nd Worst out of 8
Urban intersections	15	11	7	8	9	12	Improving Trend	1st Worst out of 8
Rural intersections	3	4	3	6	5	14	Improving Trend	2nd Worst out of 8
All intersections	3	2	1	1	1	1	Consistent Problem	1st Worst out of 8
Rural road loss of control and/or head-on	61	60	56	48	49	23	Worsening Trend	1st Worst out of 8
Motorcyclist involved	54	36	48	34	31	47	Consistent but not a problem	2nd Best out of 8
Cyclist involved	1	7	7	10	2	5	Worsening Trend	2nd Worst out of 8
Pedestrian involved	1	7	9	14	33	27	Improving Trend	2nd Worst out of 8
Driver Distraction	58	8	19	16	16	11	Worsening Trend	2nd Worst out of 8
Fatigue	56	60	40	40	42	51	Improving Trend	3rd Worst our of eight
Older road users (>75years)	14	8	15	9	5	4	Worsening Trend	1st Worst out of 8
Restraints (seatbelt not worn)	42	43	38	39	45	50	Improving Trend	3rd Worst our of eight

Comparing Invercargill's peer group authorities (as shown in Figure 2.19), Invercargill and Palmerston North have similar amounts of "red", with Porirua being mostly "green" and a relatively safe network in comparison.

Of the 15 indicators, Invercargill is amongst the worst 15 in New Zealand for six of them. The communities at risk register provides good evidence that Invercargill is the worst performer in our peer group in regard to road safety risks.

Figure 2.19 Peer Group 2021/22 Comparison

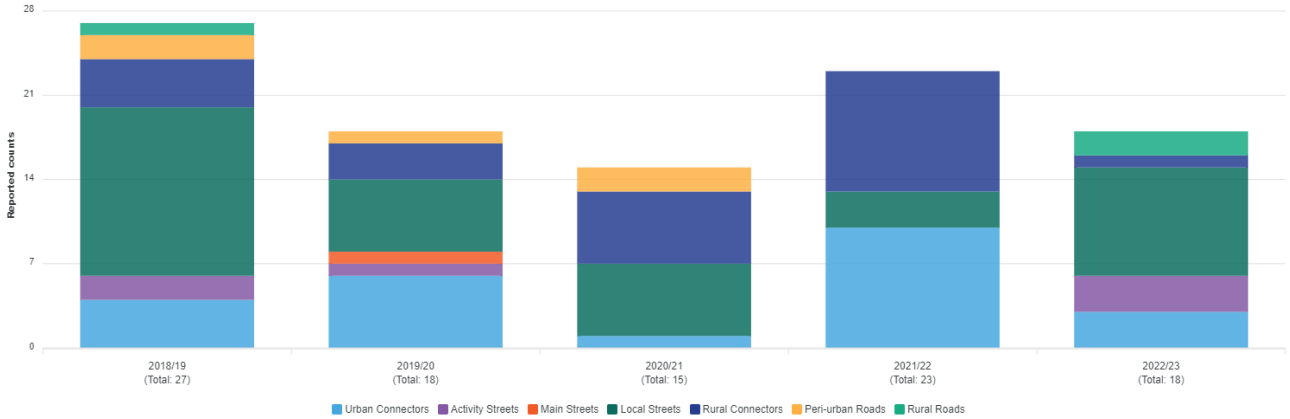
	ICC	CCC	KCDC	Napier	Nelson	PNCC	PCC	UHCC
All deaths and serious casualties	21	62	59	44	42	19	64	56
Young drivers (aged 16-24yrs)	18	56	38	47	43	37	59	60
Alcohol and/or drugs	29	47	59	39	42	24	49	66
Speed (too fast for the conditions)	26	59	64	34	28	18	56	46
Urban intersections	12	34	48	27	41	25	60	47
Rural intersections	14	32	44	43	19	2	60	18
All intersections	1	11	49	8	16	3	59	30
Rural road loss of control and/or head-o	23	63	62	58	44	46	67	49
Motorcyclist involved	47	49	45	40	27	25	39	28
Cyclist involved	5	24	26	1	45	19	52	51
Pedestrian involved	27	39	62	14	43	28	63	65
Driver Distraction	11	40	58	42	4	18	28	71
Fatigue	51	63	64	46	58	53	47	68
Older road users (>75years)	4	34	27	19	5	61	53	10
Restraints (seatbelt not worn)	50	63	66	46	69	37	61	55

ONF Safety Data

Deaths and Serious Injuries

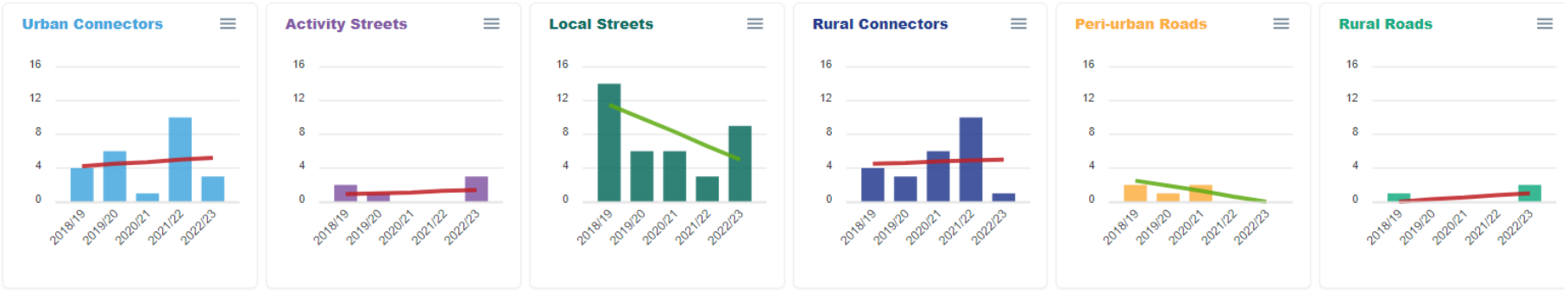
Further evidence is provided in the ONF data as shown below this chart shows the cumulative deaths and serious injuries counts for the last 5 years to 2022/23, showing performance by ONF street category.

Figure 2.20 Serious Injuries and Fatalities – Total



The 5-year linear trends below are showing an increasing trend except for Local Streets that were very high at the start of the 5 year period but are again trending up from a high in 2018/19.

Figure 2.21 Serious Injuries and Fatalities – Trend

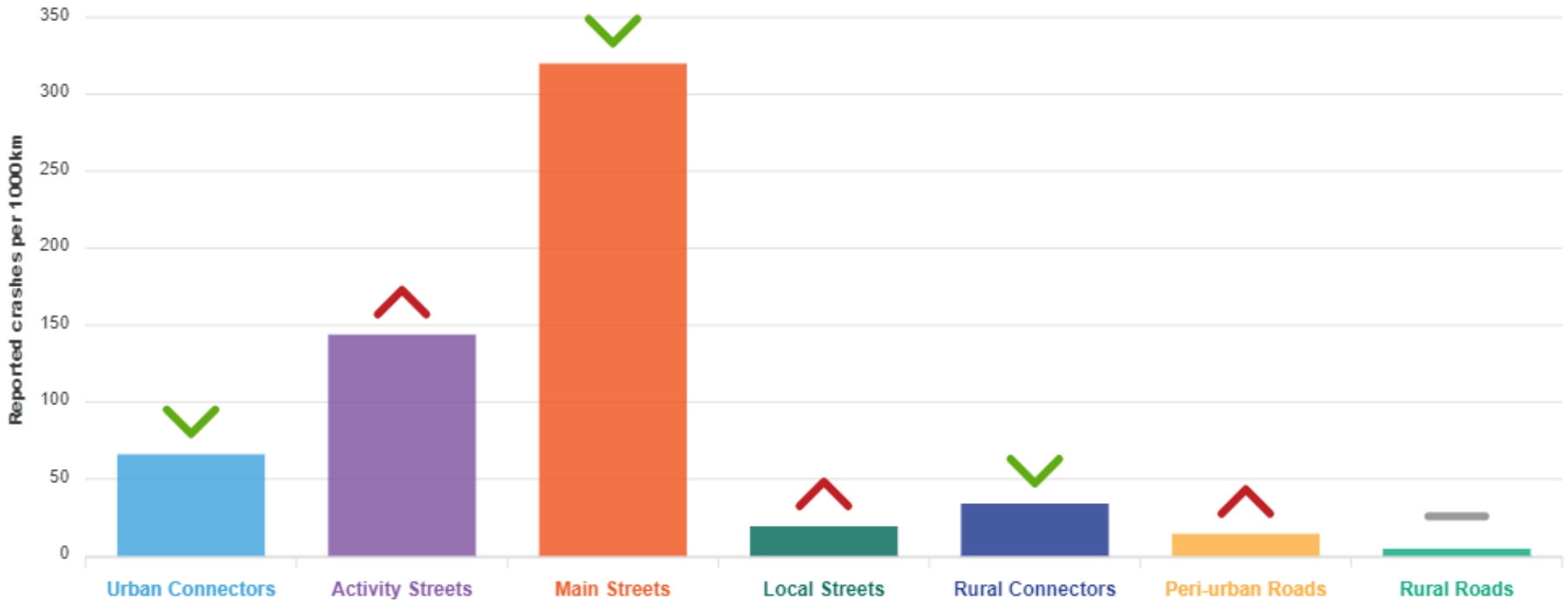


Collective Risk

Collective risk measures the total number of reported crashes per kilometre each year on the network. As expected, most crashes occur on the busier roads.

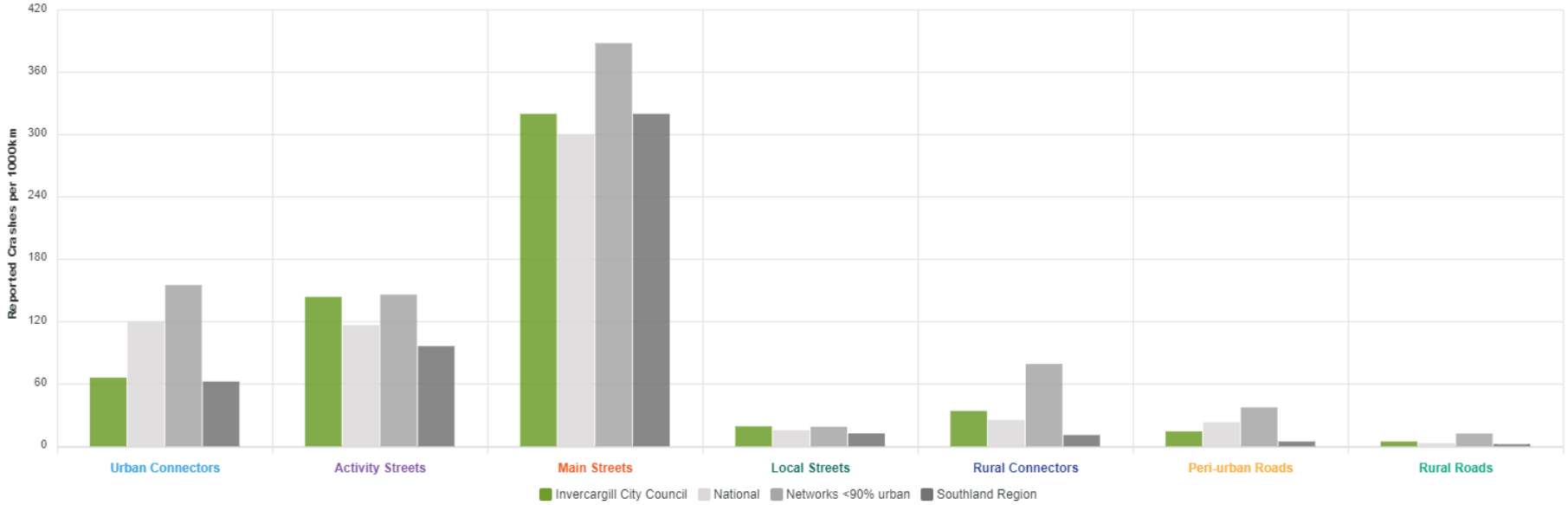
This chart shows for each ONF street category, the number of crashes involving deaths and serious injuries per 1000km, averaged over ten years. The arrow above each bar shows the direction of the trend for each ONF street category.

Figure 2.22 Collective Risk – Average annual reported crashes and trend in crashes



For the 2022/23 year, in terms of peer networks, Invercargill appears to be performing slightly better across the peer group in street categories, but worse than the regional average, and similar against the national average.

Figure 2.23 Collective Risk – Reported crashes per 1000km



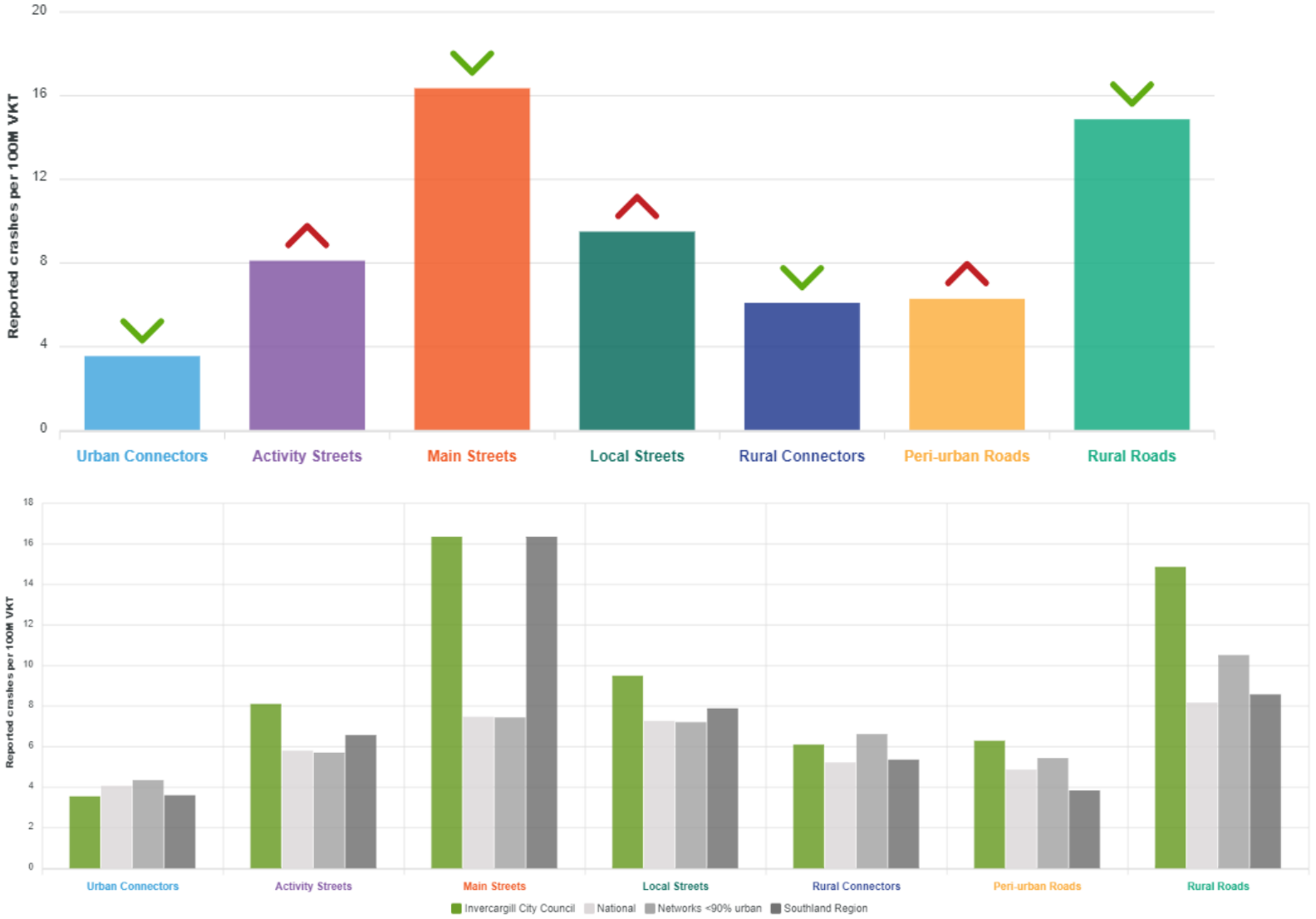
Personal Risk

Personal risk measures the total number of reported crashes by traffic volume each year on the network, a more "exposure-focussed" measure. Exposure tends to be lower on higher traffic volume roads.

This chart shows for each ONF street category, the number of crashes involving deaths and serious injuries per 100M vehicle kilometres travelled (VKT), averaged over ten years. The arrow above each bar shows the direction of the trend for each ONF street category.

For the 2022/23 year, in terms of peer networks, Invercargill has a higher personal risk exposure on all roads except Urban Connectors. Which is a trend that is continuing.

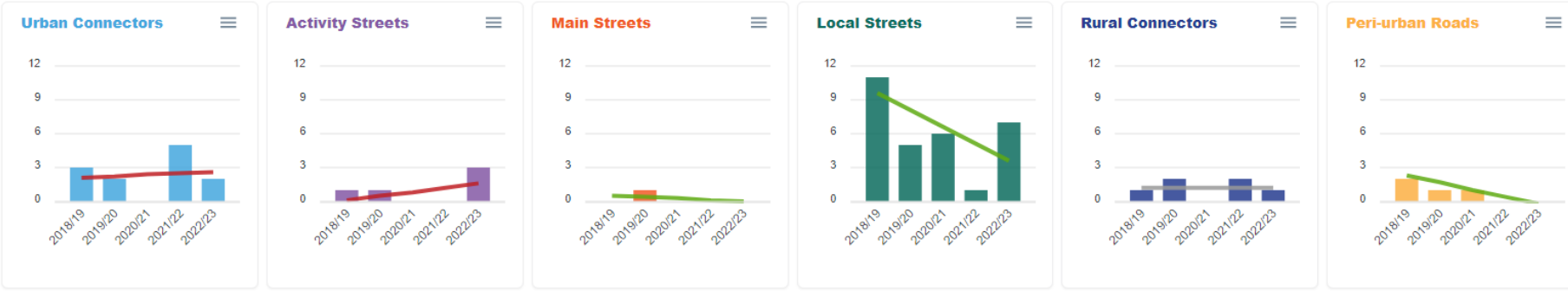
Figure 2.24 Personal Risk – Average annual reported crashes and trend in crashes



Intersections

While intersections are a significant problem for Invercargill, trend lines are reasonably stable over the 5 year period. There was a very significant spike in intersection crashes on Local Streets in 2018/19 that accounts for the increase that year.

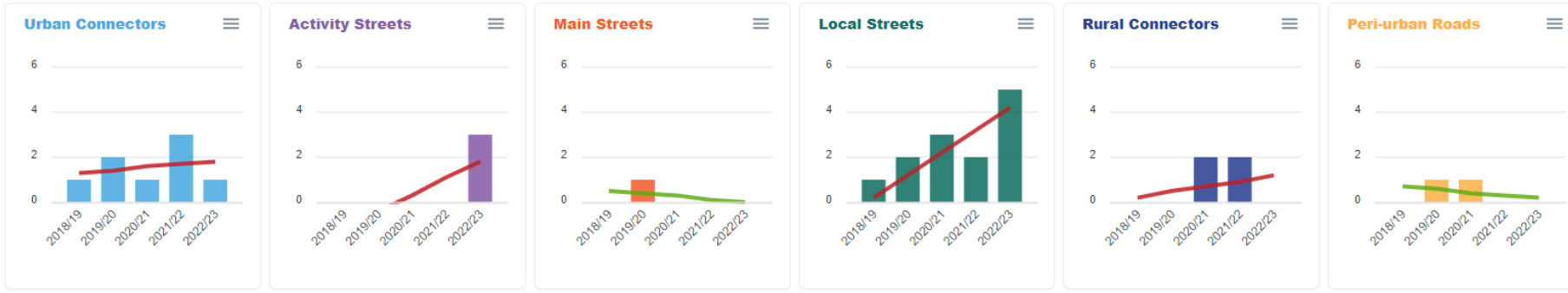
Figure 2.23 DSI at Intersections



Vulnerable Road Users

The number of reported serious injuries and fatalities (DSI) involving vulnerable users on the network has been increasing over the 5-year period below. The fluctuations are significant due to this report being generated from very low accident numbers, but don't show a good trend.

Figure 2.24 Vulnerable Road Users DSI



Key Messages – Safety

Evidence supports that:

- Invercargill has one of the worst safety records in New Zealand and the worst within our Peer Group – especially at intersections and crashes involving vulnerable road users and distracted drivers.
- Deaths and serious injuries are trending upwards, excluding a spike in 2018/19.
- Personal risk (reported crashes by traffic volume), Invercargill has higher personal risk exposure on all roads except Urban Connectors.

2.6.2 Asset Condition and Performance

The evidence relating to this area includes high level condition indicators as well as “value for money” or “cost-efficiency” measures.

Outputs from the Te Ringa Maimoa Reporting Tool are described below (also see Appendix 3).

ONRC Condition Data

Pavements – Smooth Travel Exposure (STE)

This measures the smoothness of journeys experienced by road users. STE is the percent of travel on roads smoother than given thresholds for each traffic group. The following figures show that Invercargill typically offers smoother travel on busier roads than most of its peers, with an improving trend on Peri-urban Streets over the last five years.

Esk Street is ICC’s only Main Street and due to its surface type will never achieve a ‘good’ score.

Figure 2.25 Proportion of travel on roads smoother than the threshold



Pavement Roughness – 85th Percentile

The next graph shows that the City's pavements are becoming more rough when measured by the 85th percentile peak roughness.

Figure 2.26 85th Percentile Roughness



Future Pavement Modelling

Advanced modelling of the network using JunoViewer has been undertaken to critically assess the long term performance of the network.

Key conclusions that can be drawn from the JunoViewer analysis described in Section 7.3 are:

- The current funding level (2021-24) for resurfacing and rehabilitation is not financially sustainable in the long term. And is under-funded by approximately 20%
- While chip seal resurfacing is being accommodated within the current budget, the treatment of deteriorating asphaltic concrete surfaces and pavement layers cannot, and a strategy is being developed to mitigate the effects of this.
- An increased long-term budget is necessary to retain the assets and the levels of service they provide to road users in the city.

Other Asset Groups

Table 2.4 Summary of Asset Groups (excluding pavements)

Asset Group	Comments
Bridges and structures	Bridges are regularly inspected and maintained in good condition. Ongoing observation required for the Tiwai Bridge as the environment is coastal and harsh. Five existing bridges with weight restrictions, not planned to be strengthened in the short term. Queens Drive East requires investigation and potential of strengthening. Expect significant renewal investment from the 2040's.
Drainage	There is no quantitative summary relating to asset condition. Significant investment required for renewals, particularly relating to older kerb and channel in association with pavement rehabilitation and the peak installation date of the 1920s, 50s and 70s. Alternative investment strategies need to be considered.
Traffic Services	There is no quantitative summary relating to asset condition. Street lighting LED conversion programme has been completed but LED will have a renewal in 20 years as a bulk investment again. Reliability of traffic signals is critical for traffic management and safety. Improvements are needed in response to customer expectations, changing mobility needs, and intersection capacity constraints.
Footpaths / Cycleways	Poor footpath condition is a key safety concern but assets are generally in good condition. Safety, accessibility and urban character are key concerns. There are issues associated with cycle lane continuity, detritus and rural cycling circuits.

Key Messages – Asset Condition

- Invercargill is performing well for STE and with slight deterioration over time.
- Similarly, the 85%ile pavement roughness has a slight deterioration.
- Pavement and resurfacing modelling has shown that long term funding increases are needed to address ageing and deteriorating surfaces and sealed roads, there is bow-wave of sealing required within this triennium.
- Bridges are in sound condition.
- Improvements in qualitative condition of other assets is needed.

Overall Financial Performance (Cost Efficiency)

Specific work category 2023 average expenditure comparisons are shown in the next set of graphs below.

The following figures use data extracted from TIO for peer group comparison. Of note:

- $ / lane-km or $ / km relate to the total length of the network
- $ / sealed km relates to the sealed length of the network

Routine drainage maintenance and renewal is at the top end of the peer group. This is likely due in large part to the large resealing and rehabilitation programmes where the old kerbs channels need repair / replacement before the road renewal work is completed.

Notably however, Invercargill is at the lowest end of the scale amongst its peer groups for expenditure per kilometre on traffic services and environmental maintenance and renewal. Given the safety issues highlighted within the problem statements, this low level of expenditure could indicate an insufficient level of investment in signs, road markings, delineation, traffic signals and street lighting. This is further addressed later in the Plan.

Given the small amount of unsealed roads in the district, the low level of expenditure relative to peers in this area is not considered a significant concern.

Figure 2.27 WC111 - Sealed Pavement Maintenance

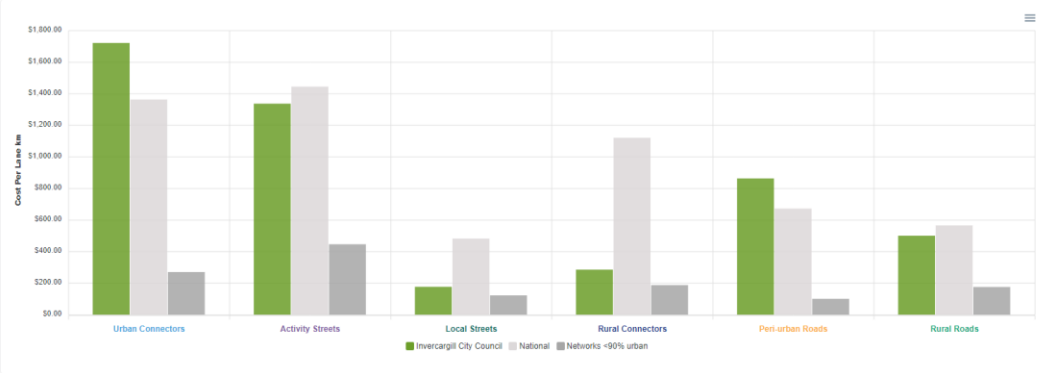


Figure 2.28 WC113 - Routine Drainage Maintenance

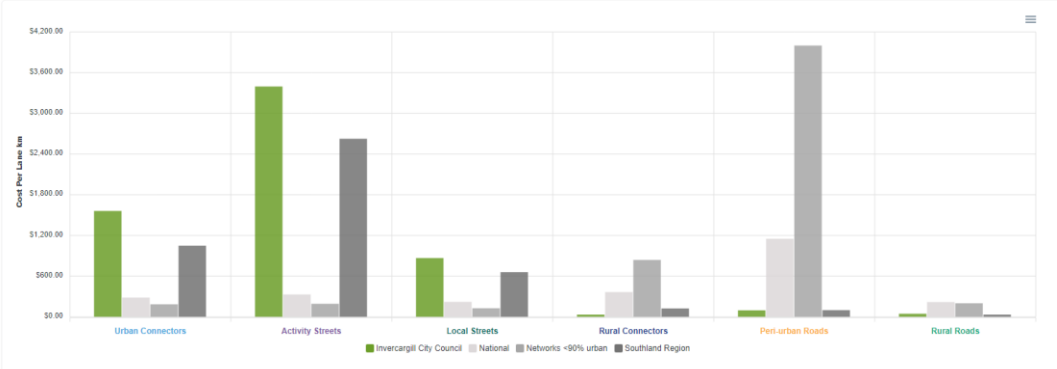
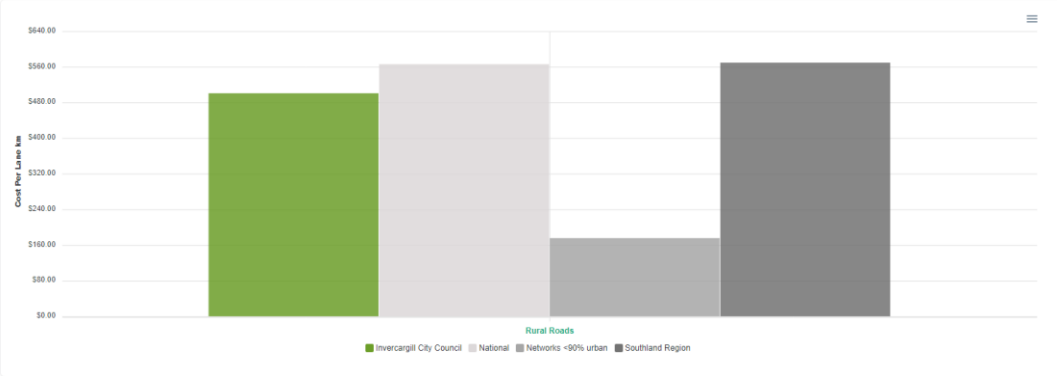


Figure 2.29 WC112 - Unsealed Pavement Maintenance



Conclusions to be drawn from the above figures:

- Invercargill's O&M costs, mostly on a per network-km basis, are similar to the average peer group for all activities.
- Drainage Renewals is the highest of all peer networks. This warrants investigation as to the causes.

Key Messages – Peer Group Cost Efficiency Measures

- Overall Invercargill City is comparable of our peer group.
- ICC expenditure is well controlled.

ONRC Value for Money Indicators

This next set of graphs looks more closely at sealed roads resurfacing statistics.

Chip Seal Surfaces

Figure 2.37 Cost Efficiency 2 – Chip Seal Resurfacing Quantities 2018/19 to 2022/23

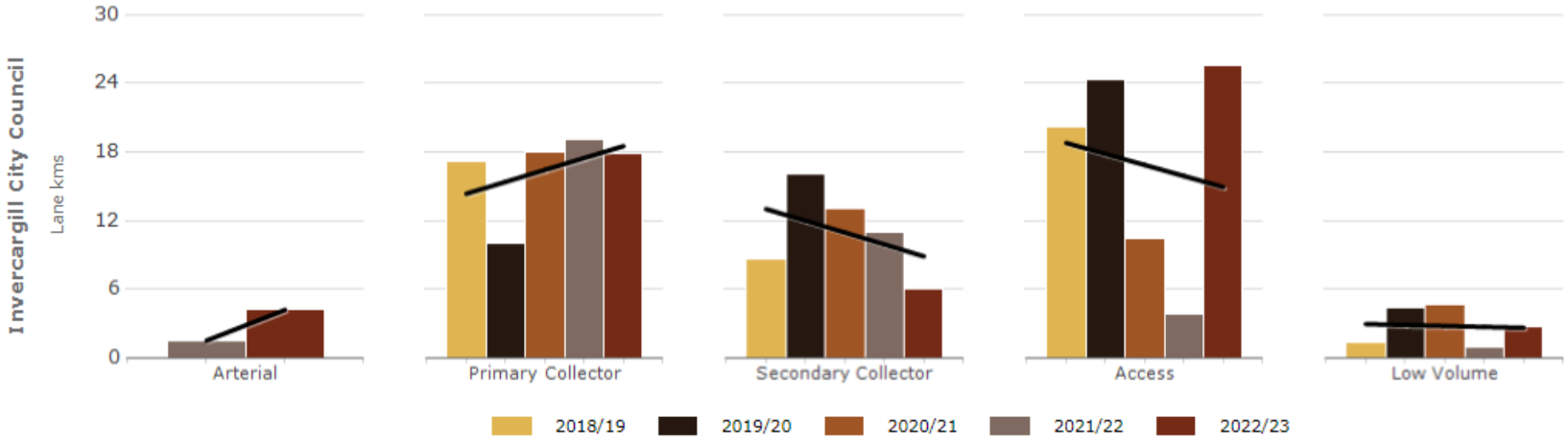


Figure 2.38 Cost Efficiency 2 – Proportion of Network Chip Seal Resurfaced (2022/23)

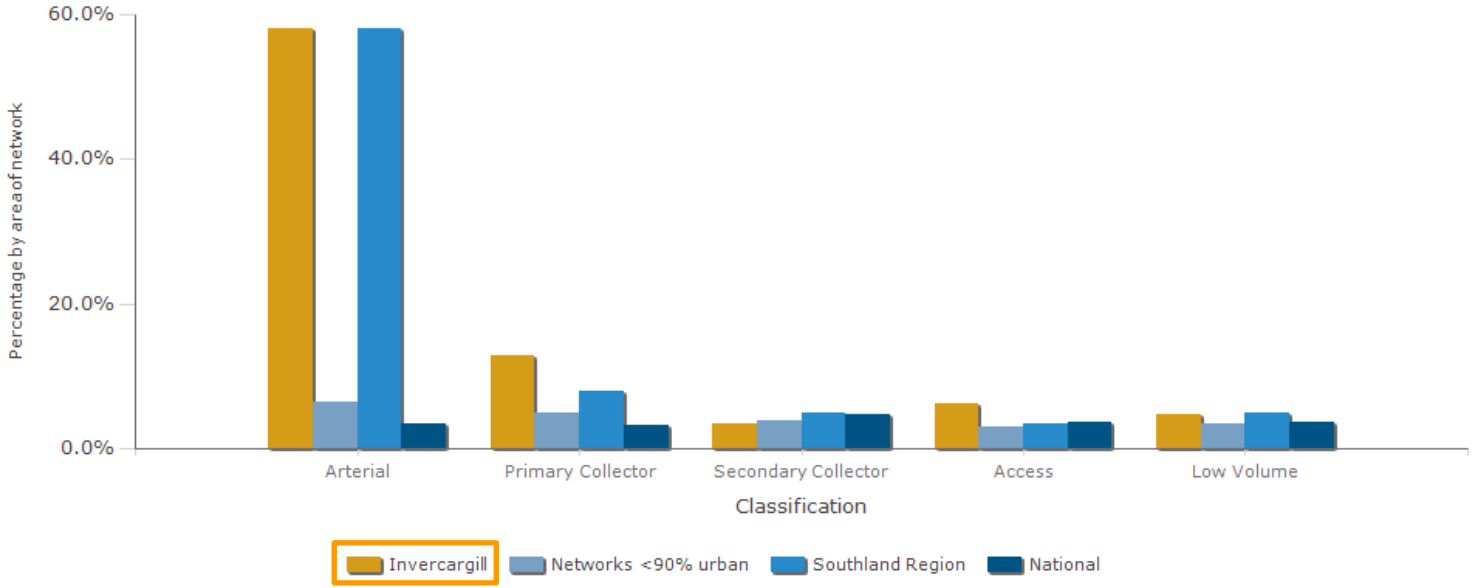


Figure 2.39 Cost Efficiency 2 – Chip Seal Resurfacing (2022/23 Cost / lane-km) – Peer Group

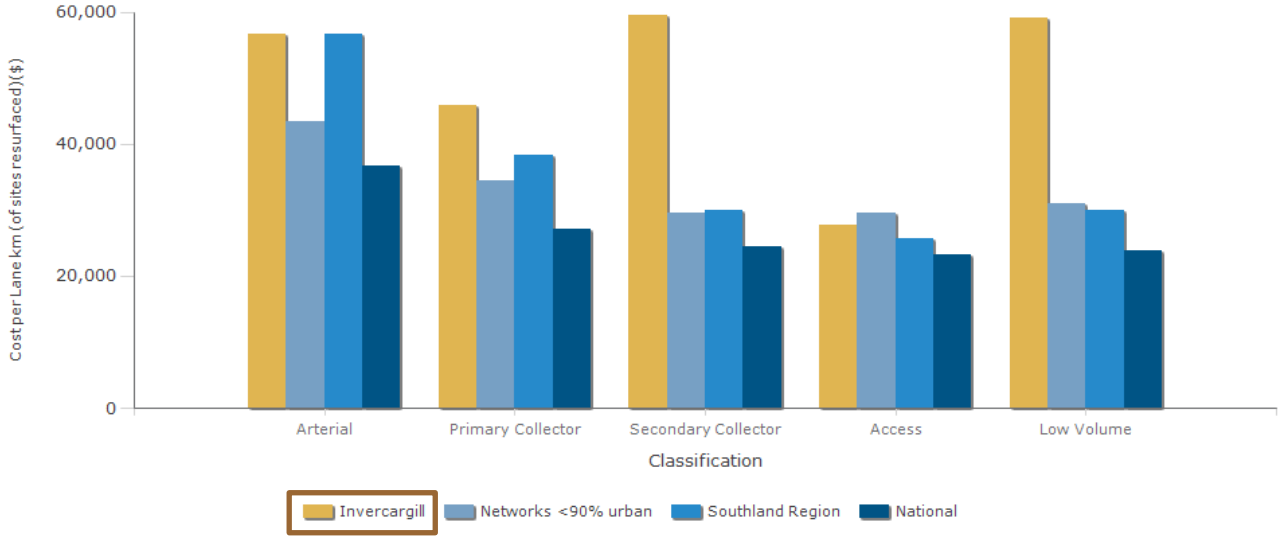
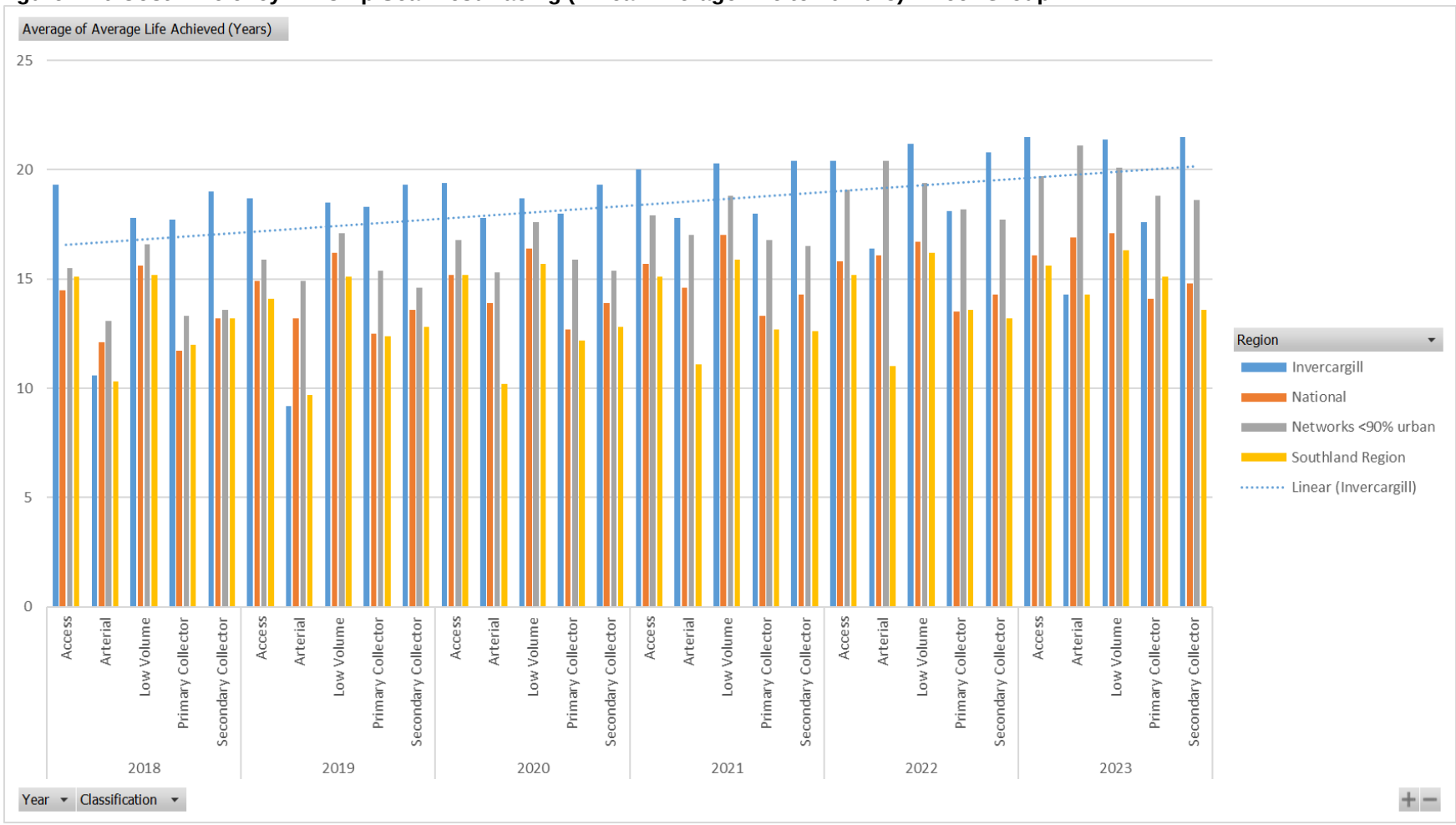


Figure 2.40 Cost Efficiency 2 – Chip Seal Resurfacing (4-Year Average Life to 2022/23) – Peer Group



Conclusions to be drawn from the above relating to chip sealing:

- Chip seal resurfacing over the past four years has increasingly been focussed on Arterial and Primary Collectors. This is due to where this class of road features in the programme – in future years this will balance out.
- In 2022/23 around 60% of Arterial roads were resurfaced. Because of lower km of these road in the network the percentage seem high in volume, reflecting a cycle time of greater than 20 years for those roads.
- Costs per lane-km is high on all roads, this is a reflection of Invercargill's wide roads.
- The average life achieved is increasing, this is an increasing risk to the network and its level of service.
  Invercargill's chip seal resurfacing life achieved for road classes is higher than our peers at around 20 years, except for Arterial. This a reflection of the level of investment in resurfacing through previous funding rounds in the 2018-21 and 2021-2024 LTP and NLTF programmes. This is an area of concern.

Asphaltic Concrete Surfaces

Figure 2.41 Cost Efficiency 3 - Asphalt Resurfacing Quantities 2018/19 to 2022/23

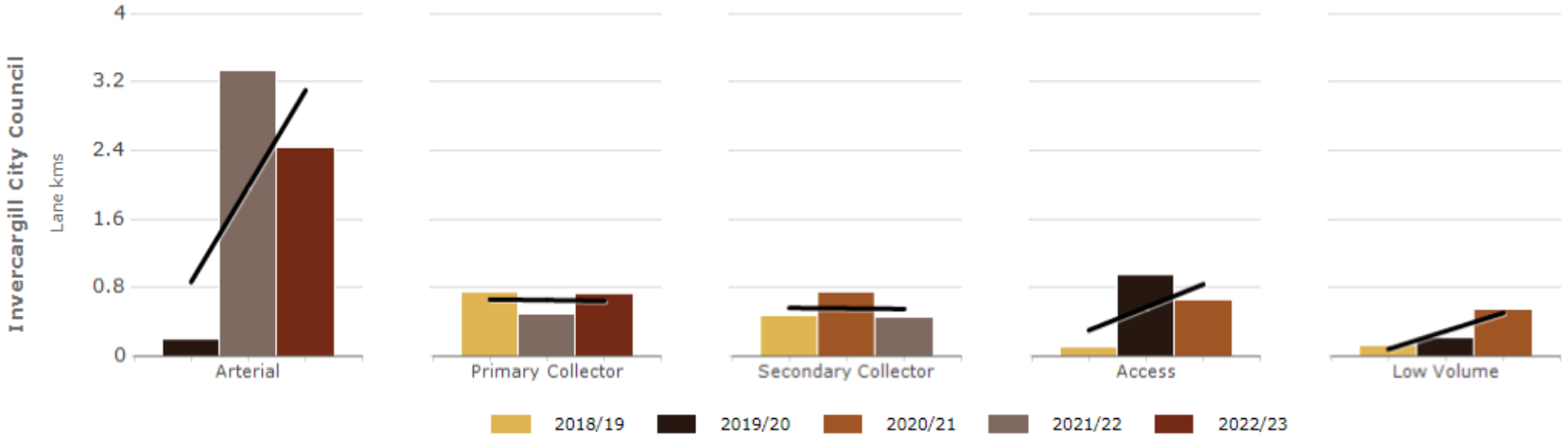


Figure 2.42 Cost Efficiency 3 – Proportion of Network Asphalt Resurfaced (2022/23)

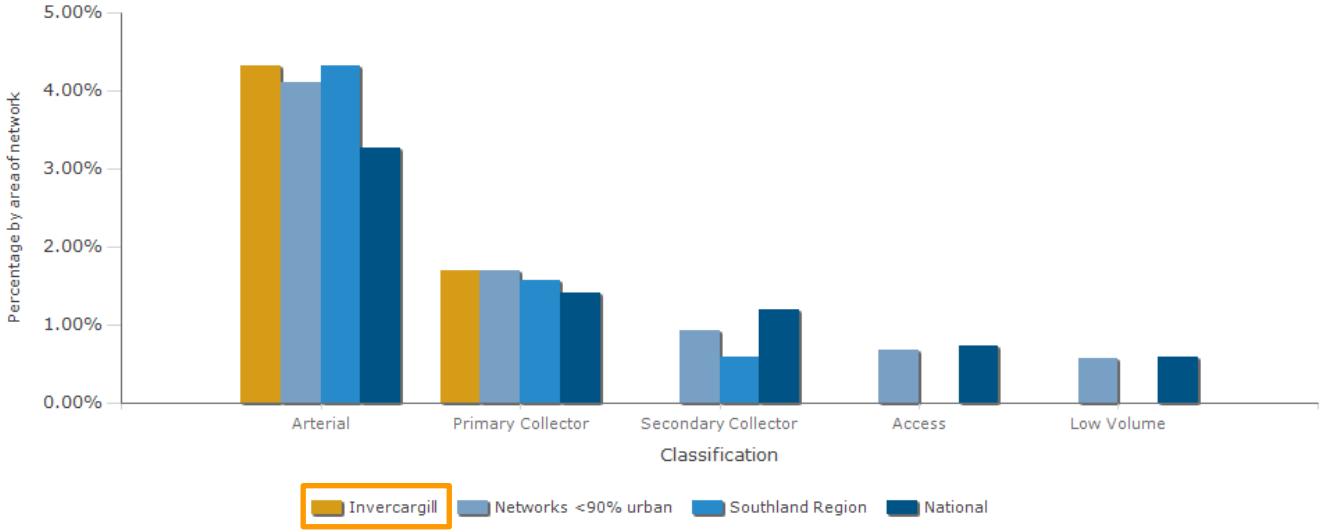


Figure 2.43 Cost Efficiency 3 – Asphalt Resurfacing (2022/23 Cost/Lane-km) – Peer Group

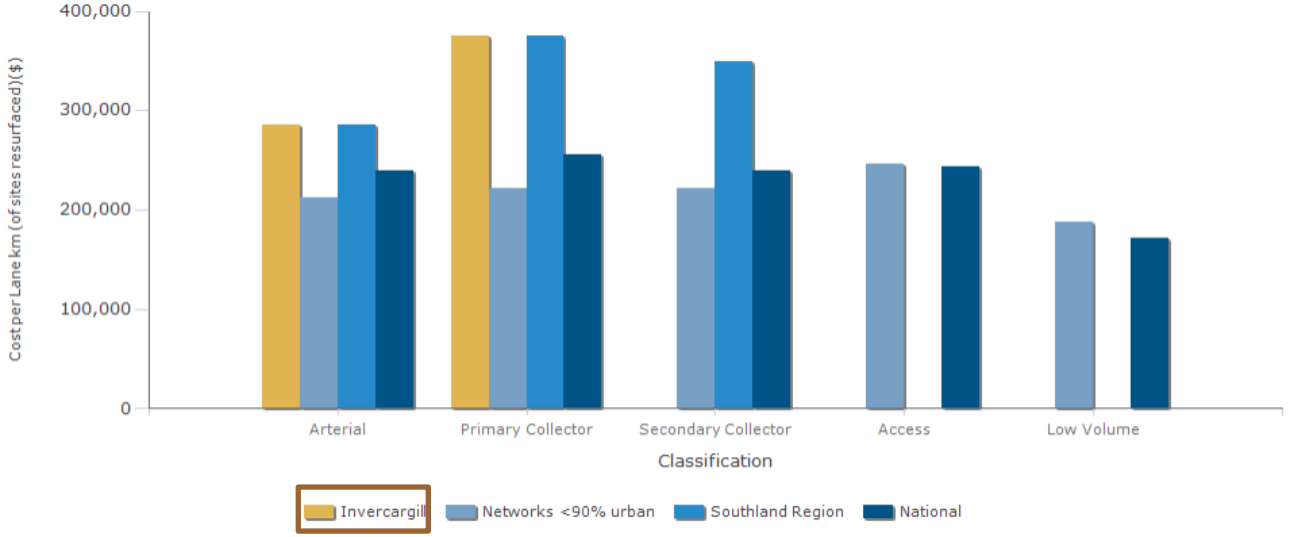


Figure 2.44 Cost Efficency 3 – Asphalt Resurfacing Compariative time series renewed annually 2018 - 2023

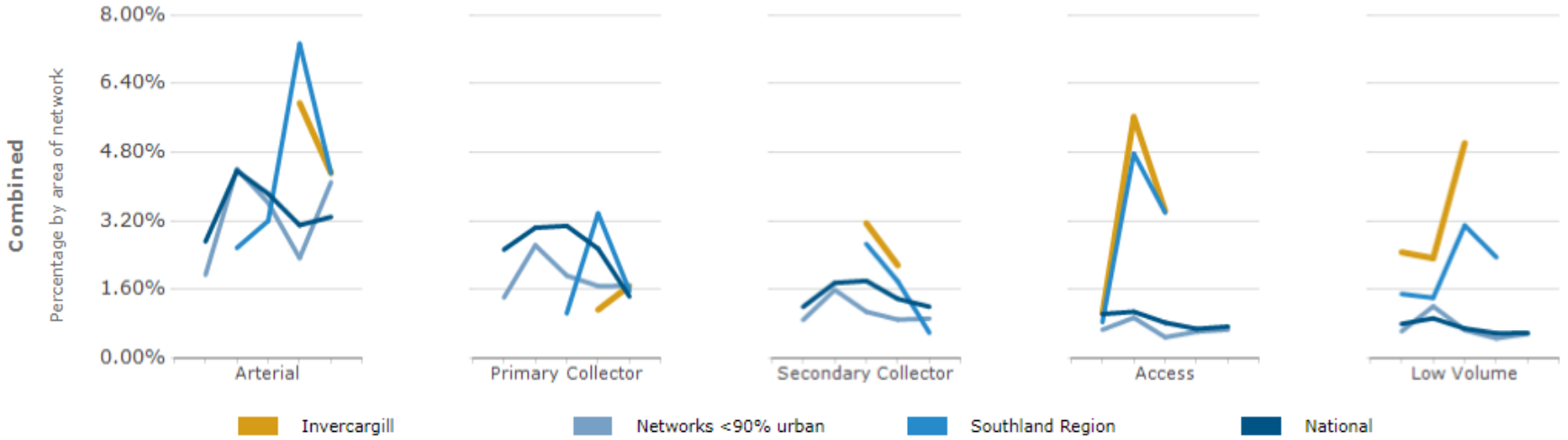
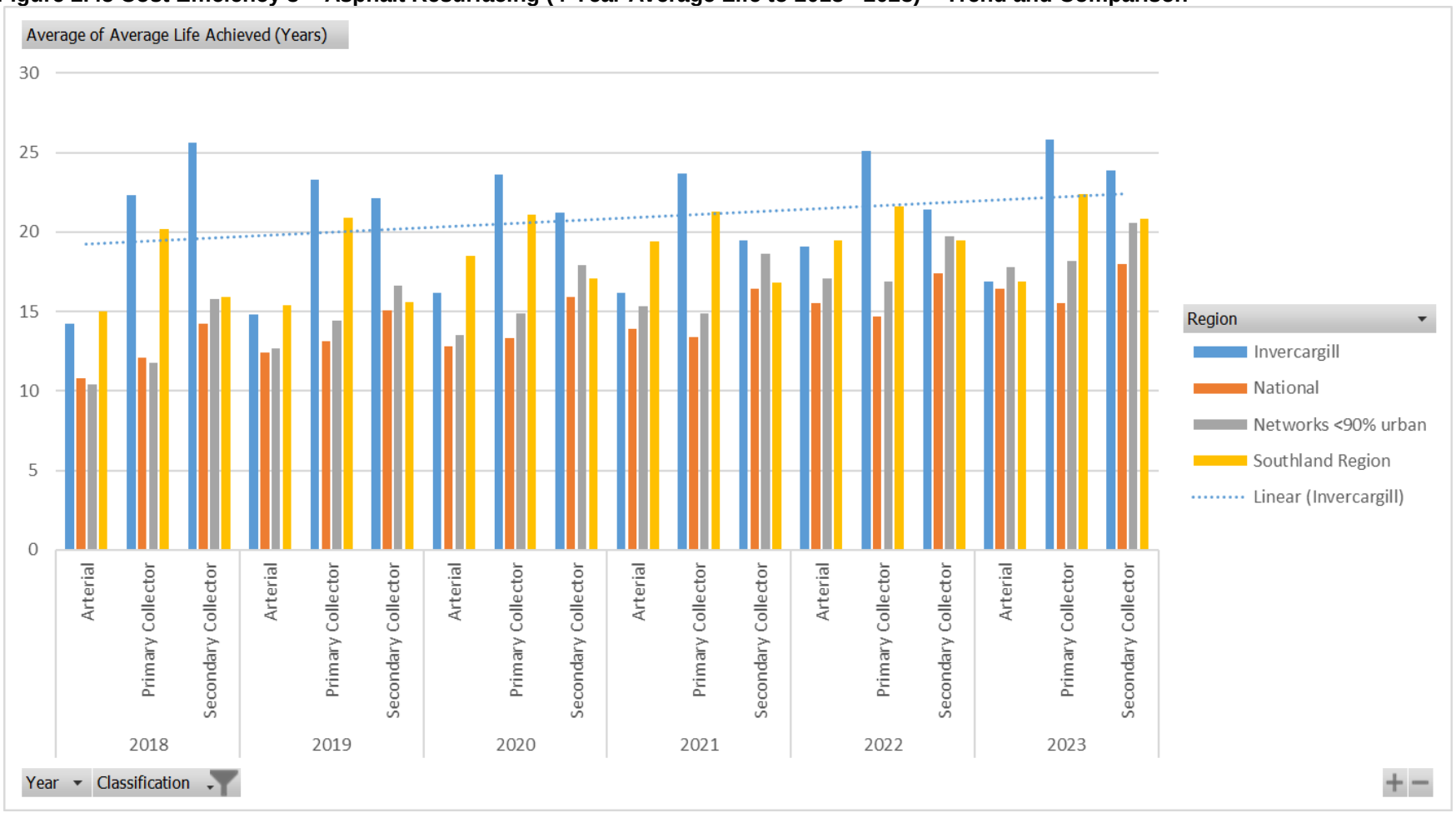


Figure 2.45 Cost Efficiency 3 – Asphalt Resurfacing (4-Year Average Life to 2018 - 2023) – Trend and Comparison

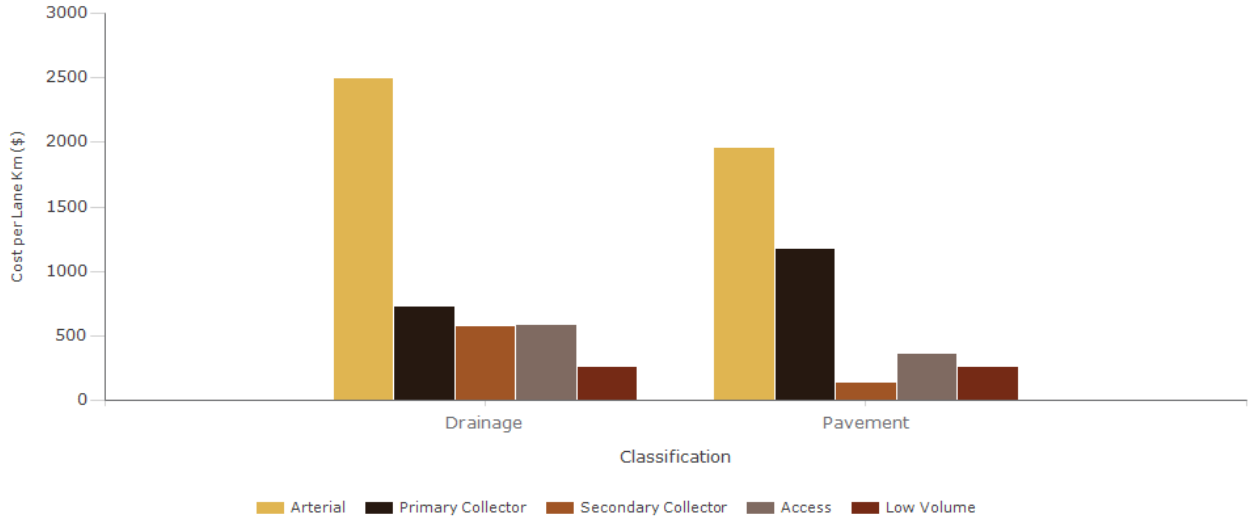


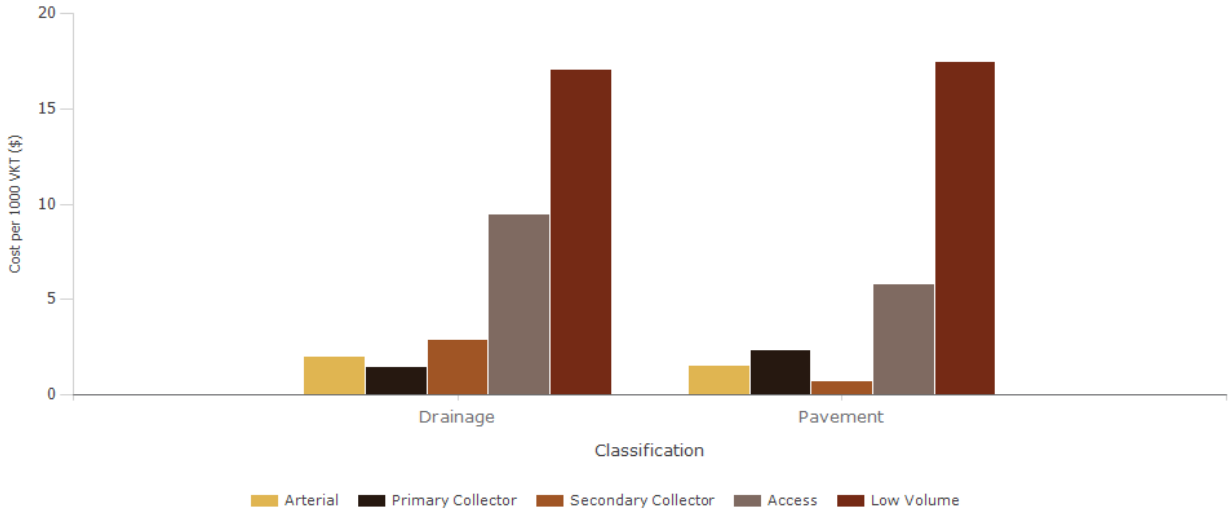
Conclusions drawn from the above diagrams:

- Asphaltic resurfacing focus has changed from access and low volume roads to arterial, primary and secondary collectors.
- The proportions of Access and Low Volume roads being resurfaced did appear to be greater than national, peer and regional averages.

- Costs per lane as with chip seals are higher than average, Invercargill's wide road widths increases the per lane km cost but our area cost are comparable.
- Invercargill is pushing relatively long surfacing lives, the network roughness and smooth travel exposure is an area of concern and the network is exposed to the risk of not achieving its level of service.

Figure 2.45 Cost Efficiency EM10 – Routine Pavement Maintenance Costs (2022/23)





Conclusions drawn from the above two diagrams:

- Costs / lane-km are higher for busier roads.
- When measured against cost per 1,000 VKT, costs are greatest for the lowest volume roads.
- These trends are indicative of a well-balanced maintenance allocation across the hierarchy, although there may be opportunities to improve optimisation.

Key Messages – ONRC Cost Efficiency Measures

- Overall chip seal and asphaltic concrete costs/m^2 are similar to peers, but increasingly higher for less busy roads – this being counter-intuitive.
- Surfacing average life for all road classes is higher and increasing in comparison to our peers pushing out past around 20 years which will have maintenance cost implications.

General Comments – Asset Condition and Performance

Roads which are not adequately maintained and renewed will over time become increasingly unfit for purpose and the level of resilience will likely decrease. Safety performance will also decline over time; for example, as pavement surfaces become less skid resistant and delineation and signs lose legibility and reflectivity.

While the network is ageing and there are signs of deterioration, the evidence above shows that the assets are generally robust. However, the key challenge relating to condition and performance is maintaining the asset in a "fit for purpose" state in an efficient and cost-effective manner.

The challenges also include:

- The community is becoming more vocal about the condition of the network and this is reflected through the evidence above.
- The community must have the capability and willingness (including fiscal) to be able to respond to changing demands on maintenance and increased programme of renewals.
- The changing nature of transport technology and how the public use this (e.g. introduction of autonomous vehicles and the safety features requirements).
- The ongoing support of Waka Kotahi and the Government who align their investment policy with the needs of the provinces and the population.
- The current Funding Assistance Rate (FAR) as it continues to reduce from 58% (2017) through to 51% and that this rate does not fall below 51%.

2.6.3 Resilience and Climate Change

In New Zealand, climate change is one of the most significant issues facing our communities. Implications and impacts on essential public infrastructure services are expected to get worse over time and will persist for decades and beyond.

For the purposes of this AMP, climate change needs to be considered from the perspective of impacts on the roading network can best responded to in terms of adaptation and how any vulnerable communities can be resilience.

Climate change could impact our infrastructure and community in many ways, for example due to:

- Rising sea levels – inundation, coastal erosion.
- More intense wind and storm events – greater risk of damage and disruption.
- Greater rainfall intensity – overloading of road drainage and natural water-courses and more flooding.
- Extreme heat – increased risk of wild-fires and asset degradation.
- More droughts – reduced water supplies and impacts on rural land-use.

Consideration in the AMP and the Programme Business Case (PBC) will need to consider guidance provided in publications such as the MfE's Coastal Hazards and Climate Change Guidance for Local Government, and the wider body of evidence available in the science community.

From a resilience to natural hazards perspective, the following events and their general consequences also need to be considered from an Invercargill perspective:

Table 2.5 Natural Hazards

Hazard	Description	Effects / Impacts
Storm / Flood / Wind / Snow	Weather based events, which are more severe and frequent with climate change.	Increasing risk of unplanned road closures due to snowfall, high winds, flooding; increased frequency of cleaning of culverts and sumps, increasing risk of damage to roading assets including washouts, slips, erosion, scour, bridge failures, wind impacts, etc.
Tsunami / Storm Surge	Hazard events relating to the sea, including storm surge (which have become more intense with climate change) and tsunami events.	Increasing risk of unplanned road closures (particularly to the airport, Otatara and Bluff) and potentially extensive damage to roading assets due to these events. Potential inundation of roads in low-lying coastal areas.
Earthquakes / Liquefaction	Fault movement, ground shaking, induced liquefaction and other effects arising from major seismic activity, such as the Alpine Fault AF8.	Unplanned road closures and potentially extensive damage to assets, particularly and walls and banks in Bluff.
Wildfire	Fires which occur in forests and on rural land, expected to become more frequent and severe with climate change.	Increasing risk of unplanned road closures, disruption and damage due to wildfire, but unlikely in Invercargill urban areas.

From a wider environmental perspective, the following aspects are also relevant to the roading activity:

- Carbon emissions enabled from use the land transport network to continue to increase.
- Carbon emissions from the delivery of the activity to have a decreasing target applied.
- Contamination of natural waterways through stormwater run-off from roads and the close proximity of waterways to our sumps (discharge time and recovery times).
- Noise and vibration increasing with increased traffic use.
- Air quality in the urban area.

Key Messages – Resilience and Climate Change

- Climate change will affect Invercargill's roading infrastructure in many ways.
- Roading infrastructure for the Invercargill network is relatively resilient to climate change.
- Communities are still vulnerable to a range of natural hazards, some will become worse with climate change. i.e. Bluff community disconnected from Invercargill if SH 1 is closed.
- Environmental issues will need attention – stormwater quality, air quality, noise and vibration.

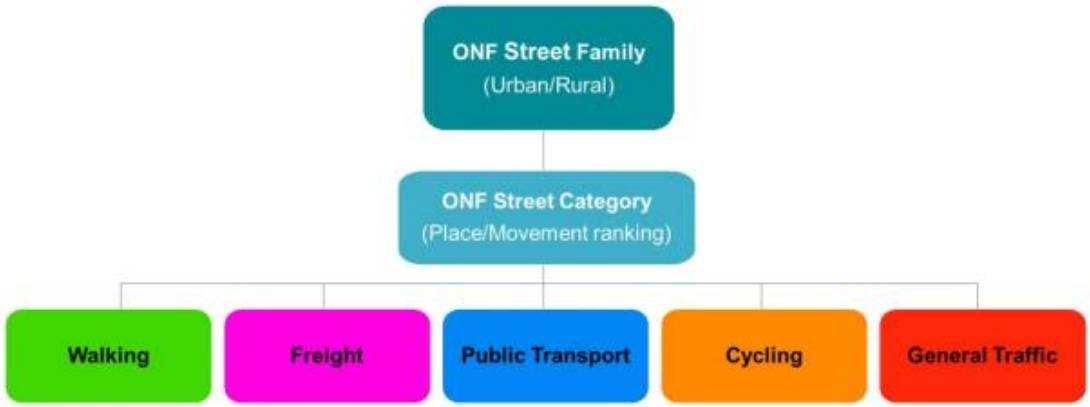
2.6.4 Accessibility

The City's grid network and open street layout means it is easy for all vehicles to access all roads in the urban network; this can lead to conflicts between through traffic and local residential activities with negative impacts. The network is in some ways "too accessible". The urban grid is illustrated in 2-44 below.

The inter-relationship between adjoining land-use, fitness for purpose of the road, vulnerable road users, and the volume of heavy vehicles can create conflicting accessibility demands with negative outcomes for residents and vulnerable users.

Changes will be made to the way the roading network is defined, broadening the definition of hierarchy to encompass active and public transport modes. Some roads may need to be de-emphasized for motor vehicle journeys, with physical changes being made to provide better, more consistent facilities for pedestrians and cyclists.

Figure 2.6.4.1. How modes fit within the One Network Framework



Some streets are very suitable to being developed and used by the community for play by their residents and there are a number of programmes such as Play Street and Innovative Streets which encourage and support these changes. The Reshaping Streets package of regulatory changes announced in July 2023 gives councils more ability to support Community organisers to apply for temporarily restrict traffic to make these events possible through a provision called Community Streets

Council is supportive of changes in use to encourage stronger emphasis on active mode transport in areas such as "to school" travel. These are areas where higher demand exist, and where minor safety improvements can be undertaken to encourage further a mode shift.

To accompany this Council has already addressed traffic speed through an Interim Speed Management Plan targeting speed for rural roads, schools and urban centres. Further speed reduction measures will be interrogated for the Full Speed Management Plan. Many of the City's crashes are relating to intersections and vulnerable road users, resolving intersection and vulnerable users' accessibility issues using both speed management and intersection layout is fundamental to improving safety outcomes.

Speed and driver behaviour have direct links and Invercargill is recognised as having poor driver behaviours. Interestingly this issue translates from low travel demand and an expectation that they should be able to travel unimpeded which is not normally available in any urban environments.

Modal choice and better transport options means having viable alternatives to making motor vehicle journeys, particularly where the journey is relatively short. The network therefore needs to cater for all modes safely and efficiently.

There are emerging issues and opportunities as transport options change, particularly with areas such as e-scooters, e-bikes, mobility scooters, strengthening of vulnerable users groups, and other community inputs. These shifts can lead to increased usage and risk for footpath users where mode conflict is created. The Invercargill evidence already shows that vulnerable users represent a high risk of injury compared to the rest of the county.

An example is footpath width. Current footpath dimensions do not always have sufficient width for new and larger scooters and the like, and a more strategic approach to improving the footpath and cycling networks may be needed. Some local direction which is supported by national policy and good research would bring a consistent approach to these issues faced by council. Some community sectors do not have a strong voice and could be disadvantaged in some decisions.

Accessibility for mobility challenged residents is an opportunity which has not been fully understood and this should be considered through any future strategies that include active transport choices.

Key Messages – Accessibility

- The City has an easy to use grid network which provides a high level of accessibility for vehicles.
- However, its functionality needs to be broadened to provide better opportunities for active modes and people. The state highway network is a key factor (opportunity or obstacle) to this.
- This grid network with many intersections also contributes to the City's safety performance.

2.7 STRATEGIC PROBLEMS, BENEFITS AND RESPONSE

The table below describes the strategic problems, benefits and actions to respond to the problems set out in the Executive Summary.

Table 2.7 Alignment of Strategic Problems to Actions

Problem	***Behaviour, user choices and network layout is resulting in fatal and serious injuries***		
		The historical design and the changing use has led to modal conflict, limited accessibility and not meeting expectations	
Benefit	**Continuous Improvement of Road User Safety**	**Improved community connectivity and social wellbeing**	**Contribute to economic growth and productivity**
Response	Working together and telling a more effective story with the community, partners and stakeholders		
	Ensure streets and roads are delivering the right outcomes for users to feel safe in there use		
		Ensure that land usage and the network work effectively together	
Solutions – Changes	*Develop a collaborative relationship plan and a community enegement strategy*		
	Invest in new technologies		
		Develop a network operating framework	
		Support clearer strategic transport planning in district and regional plans	
	Invest in the use and improvement of data collection and analysis		
	Indentify and resolve issues across the network and high risk intersections		
	Develop new road safety and user education approaches		
Solutions – Assets	*Network Improvements*		
	Network Maintenance and Renewal Programmes		
	Address identified risks on the network		
		Develop supportive infrastructure for enabling alternative mode use	
Actions – Strategic	Develop and implement Safety Strategy (linking local and regional strategies to the "Road to Zero")		
	Updating our understanding of the vulnerabilities of the City's roading assets and the interdependencies with other lifeline utilities.		
	Develop PT strategies to encourage use, and use policy settings to encourage and support behaviours.		
	Promote and encourage change for walking, cycling and public transport to provide greater transport choice, integration and flexibility, along with the promotion of good public health outcomes.		
	Multi-modal network optimisation to identify improvements that can be made to walking, cycling and public transport modes at a network level. This includes the development of footpath, cycling and public transport hierarchies.		
	Funding and addressing asset defects which have a safety implication as a priority.		
	Improving adaptive capacity and capability within the organisation in order to better manage disruptive events.		
	Ensure that new developments support modal choice and provide opportunities for people to travel less by private motor vehicle.		
	Strengthening leadership in encouraging Active Transport Modes.		
	Working with Waka Kotahi on a red-light camera strategy.		
Actions – Tactical	Implement travel behaviour programmes to encourage more efficient travel patterns and to reduce the number of single occupancy vehicles at peak times.		
	Reviewing levels of service where under or over-delivery may be occurring (having community input and aligning to ONF where appropriate).		
	Investigating potential mitigation options for the roading network – both short and long-term (including maintenance regimes to lessen impacts through to investment in greater resilience, e.g. Stead Street stopbank).		
	Developing a strategic approach to drainage and footpath replacement and upgrades with better modelling and condition ratings.		
	Crash Reduction Studies		
	Reviewing frequency or doing investigative testing where appropriate to the level of risk of asset failure and the criticality of the asset.		
	Optimising road maintenance and renewal activities across the network to achieve the right balance of investment when assessed against the adopted levels of service, asset risk, and asset criticality.		
	Developing a proactive approach to safety issues where asset condition is a contributing factor.		
	Keeping up to date with the anticipated effects of natural hazards and climate change on the City's roading network.		
	Participation in lifelines work with Environment Southland, other local authorities in the region and other CDEM stakeholders.		
	Promote mode shift to reduce dependency and impacts on travel by cars.		
	Reviewing acceptable risk acceptance levels to ensure that work activities are appropriately targeted.		
	Develop and implement Council policies to support reduction in greenhouse gases (e.g. electric cars and bus fleets).		
		Review freight routes in the City and encourage focused travel on hierarchy by HPMV and other heavy traffic (e.g. on ONF appropriate routes).	
	Supporting community initiatives relating to education and enforcement with our road safety partners and through roads safety coordination arrangements.	Determine and implement traffic changes to improve behaviours and whether any network changes or optimisation is required to address routes that should be "de-tuned" with respect to either freight or "rat running".	
	Working strongly with other community providers and strengthening community led initiatives such as Drive my Life and Right track which are targeted at specific sectors.		
	Improve data capture and analysis to enable the communicating 'the transport story'.		
	Work with similar focused regional groups (e.g. Sports Southland and Cycling Southland) to optimise the community efforts for regional learnings (such as bike training).		
Actions – Operational	General condition montioring, network inspections, safety audit processes		
	Having response plans for storm and climatic events.		
	Making specific improvements that have proven safety benefits – such as minor improvements in local traffic management schemes which reduce speed, intersection controls, improved delineation, etc.		
	Investigation of actual and potential safety deficiencies or issues which are targeted at specific road safety problems (intersections and vulnerable road users).		
	Managing speed in the community.		
	Strengthening education and communication projects to ensure community understanding of Risk.		

2.8 STRATEGIC CASE SUMMARY

The following table provides a summary of the problems, investment benefits, strategic responses, and KPIs. It also links the benefits to GPS 2021 strategic priorities and Invercargill's customer levels of service (LoS), highlighting current and proposed trends.

Table 2.6 Strategic Case Summary[6]

ICC Problem Areas	Causes of Problems	Investment Benefits	Strategic Response	Benefits KPIs[1]	Benefits Measure	Measure Description	Customer LoS?	GPS 2021 Strategic Priority	Current Trend	Target Trend
Behaviour, user choices and network layout is resulting in fatal and serious injuries	High rates of crashes at intersections Poor driver behaviour Vulnerable road users affected – especially pedestrians and cyclists Poor alternative mode travel choices Poor road layouts Greenhouse gas emissions from transport use continue to increase	Continuous improvement of road user safety	See table above	Improve safety and reduce DSI	(23) DSIs	Number of deaths and serious injuries (GPS 1)	DIA 1	Safety	Trending down	Reduce
					(24) Personal risk (crash rate)	Average annual fatal and serious injury crashes per 100 million vehicle-kilometres	ONRC 3	Safety	Stable to worsening	Improve
		Improved Community connectivity and socail wellbeing		Improve comfort and customer experience - access	(41) Network condition) - road	Percentage travel on road network classified as smooth as per defined level of service	DIA 2 ONRC 6	Safety and Better Travel Options	Stable to improving	Improve / maintain
The historical design and changing use has led to modal conflict, limited accessibility and not meeting expectations	Network vulnerable to natural hazards – e.g. storms, earthquake, tsunami, etc Community vulnerable to climate change – especially low-lying areas, with only one lifeline road in or out Impacts of Climate Change Invercargill has a car centric network State Highway within our network disects the City and can act as a barrier Adjact land use a network conflict Effects of increasing traffic loads on pavements Assets will deteriorate without appropriate treatment – especially critical for pavements, drainage and structures Effect of other utilities within network Funding bid approvals not meeting network requirements			Increase access for people	(18) Mode shift from single occupancy private vehicle	Mode share for people (i.e. % of travel by mode)	NA	Better Travel Options	Not measured	Increase shift
					(28) Access – perception	Perception of safety and ease of walking and cycling	NA	Better Travel Options	Not Currently measured	Improve
					(29) Access to key destinations (all modes)	% of people with access to jobs and essential services (i.e. shopping, education, health) by mode (GPS 10, 11)	NA	Better Travel Options	Not Currently measured	Improve
				Reduce GHG and pollution	(17) CO^2 emissions	Tonnes of CO^2 equivalents emitted	NA	Climate Change	Increasing	Reduce
		Contribute to economic growth and productivity		Improve resilience	(52) Temporal availability	Number and duration of unplanned road closures: urban >=2 hours; rural >=12 hours	ONRC 5	Resilience (Outcome)	Uncertain	Improve / maintain
				More efficient pricing	(4) Cost efficiency	Overall cost per km and vkt of routine maintenance activities, by work category	ONRC 9	Efficiency (Outcome)	Compar-able to or better than peers	Improve / maintain
				Reduce financial cost of using transport	(2) People – mode share	Mode share for people (i.e. % of travel by mode) (GPS 13)	NA	Better Travel Options	Not Currently measured	Improve
				Increase / maintain freight throughput	(10) Freight – throughput weight	Number of vehicles TIMES average load per vehicle in tonnes	NA	Improving Freight Connections	Not Currently measured	Improve / maintain

[6] Review when 2024 GPS is released

The next table provides a summary of key gaps relating to GPS 2021 priorities:

Table 2.7 GPS 2021 Gaps[7]

GPS Strategic Priority	GPS Gap	Rationale	Priority	Strategic Responses	GPS Measures to Address
Safety	Personal risk is rising (crash rate DSI per 100m km VKT)	Inconsistent with Road to Zero targets. Invercargill has one of the worst performing safety networks in the country.	High	Refer S1-S13 below	1. Deaths and serious injuries on the road and rail corridor 2. Hospitalisations from road crashes 3. Pedestrian and cyclist injuries 4. Deaths and serious injuries where alcohol, drugs, speed, fatigue or distraction was a contributing factor 5. % of state highway and local road networks modified to align with a safe and appropriate speed 6. % of road network covered by automated safety cameras 7. % of urban network with speed limit of 40 km/h or below
Better travel options	Mode share transferred from single occupant private vehicles to other modes is not increasing	Contributes to increased greenhouse gases. There are currently poor choices available for transport users.	Medium	Refer A1-A4, A7 below	12. % of population with access to frequent public transport services 13. Mode share for people (i.e. % of travel by mode) 14. Number of passenger boardings using urban public transport services (by region) 17. Network kilometres of walking and cycling facilities delivered 18. Cycling count in urban areas
Freight connections	Climate change and increasing sea levels affecting key freight routes (e.g. to Port)	Disruption impacts need to be better understood.	Low-Medium	Refer RCC1-RCC6 and A5 below	24. Kilometres of road and rail infrastructure susceptible to coastal inundation with sea level rise
Climate Change	Greenhouse gases and amounts of pollution from transport are continuing to increase	As traffic volumes continue to increase without a significant shift away from single vehicle occupancy and/or non-fossil fuel, achieving reduction targets is unlikely to occur.	High	Refer RCC2, RCC7 and A1-A5 below	26. Tonnes of greenhouse gases emitted per year from land transport 27. Tonnes of harmful emissions emitted per year from land transport 28. Number of people exposed to elevated concentrations of land transport-related air pollution 29. Number of people exposed to elevated levels of land transport noise

[7] Review when 2024 GPS is released

2.9 KEY ASSUMPTIONS

2.9.1 Internal, Financial and External Factors

The Long Term Plan Background and Assumptions 2024-2034 document lists the key assumptions which have been assumed and used within this plan. These are as follows:

Table 2.9 Key Assumptions - Internal, Financial and External Factors

POPULATION[8]	Likelihood	Certainty	Consequence	Council Response
Population growth As at 30 June 2023, the estimated population of Invercargill is approximately 57,900[9]. The population is projected to increase over the next ten years but growth will depend significantly on whether the Tiwai Point smelter closes or remains open, and whether or not various industries are developed as envisaged in the Beyond 2025 Regional Long Term Plan.	Likely	Medium	Moderate	Although population growth in excess of the assumptions will have a moderate to significant impact on the Council finances this will have significant lead time. Council will be able to monitor the applications for resource consents and use this as guidance for the population growth into the future. A population decline would be a more significant impact but is not expected.
Population growth - Tiwai remains open If Tiwai Point remains open, it is projected that the population of Invercargill will increase by a little over 5,000 people over the course of the Long-term Plan.	Moderate/ Likely	Medium	Minor	Tiwai remaining open may result in further investment in power to support new industries. Council will continue to advocate for this to Central Government.
Population growth - Tiwai closes With the closure of Tiwai Point growth in population of just over 4,000 people is expected.	Unlikely	Medium	Moderate	Council has participated in the Just Transitions programme to support transition in the case of Tiwai closure and will continue to liaise

[8] Infometrics report "Southland Region forecasting scenarios for Beyond 2025 Southland", June 2023
[9] Stats NZ Tatauranga Aotearoa Infoshare data, retrieved 24 January 2024 (https://infoshare.stats.govt.nz/Default.aspx)

				with the Enduring Oversight Committee to support the community.
Diversity The population will continue to become more diverse. The Māori population will grow from 19% to 25%. The Asian population will grow from 8% to 13%.	Likely	High	Minor	Council will increase engagement opportunities for different parts of the community to help support all voices being heard. Changes to Council services are expected to be able to be accommodated from within existing operational budgets through adjustment of focus.
Ageing population Those aged 65 and older will form 24% of the population in 2034, which is higher than the current aged population in 2023 (estimated as 10,790 of 57, 900 (19%)).	Likely/ Almost Certain	High	Moderate	Demographic changes are clear and while future migration patterns may offset aging to some extent this is not expected to be of a high enough level to counter the known level of aging. Council is considering how to respond to changing housing needs for older people through provision of elderly housing, adjustment to the District Plan and potential partnership projects. Impacts on other services including public transport, libraries and pools (e.g. hydrotherapy pool) are being planned for.

Households Households will increase from 23,256 in 2022 to 26,087 in 2034. The number of households stagnated over 2020-2021, but is projected to show positive growth over the course of this LTP, with growth peaking at 1.1% in 2032. The average size of households is expected to reduce from 2.39 to 2.34 by the end of this LTP.	Moderate/ Likely	Medium	Moderate/ Major	The number of households underpins the rating base and Council revenue for activities. A decline or slower growth in households would require Council to review services and/or financial strategy.

SOCIAL	Likelihood	Certainty	Consequence	Council response
Socio-economic Inflation will continue to squeeze household budgets and impact abilities to pay rates. Inflation is expected to stay above 3% until 2025/2026.[10] [11]	Moderate/ Likely	Medium	Major	Economic volatility remains high with economists urging caution on reliability of forecasting. Significant increases in inflation will impact not only Council's planned expenditure but the community's ability to pay. Higher than expected inflation may require review of services, capital investment and/or financial strategy. Lower inflation will improve Council's position and ability to deliver.

[10] Infometrics report "Economic update for Long Term Planning for Invercargill City Council", April 2022, p11
[11] RBNZ "Household inflation expectations (H1)", August 2023

Community resilience Tiwai Point Aluminium Smelter is expected to continue operating for the time of the Long-term Plan. Should Tiwai close this is expected to have an impact on community resilience.	Unlikely	High	Moderate	Council has plans in place, including community support for the Just Transitions Connected Murihiku programme and support for Great South to deliver economic diversification options. Additional investment may be required on any announcement of closure.
Community resilience Although the Zero Fees scheme has been extended through 2024 for Southern Institute of Technology | Te Pūkenga, it is unlikely to continue throughout the life of the Long-term Plan. This will have an uncertain level of negative impact on Invercargill's population and economy.	Likely	Low	Minor	The Zero Fees Scheme has been an important tool in lifting the skill base of the local community as well as attracting new people live in the city. Loss of Zero Fees will remove a competitive edge for the city which has potential unknown longer term impacts. Changes in this assumption are not expected to have a significant impact on financial modelling but rather impact the environment which Council operates in.
Housing stock Urban Invercargill's housing supply rate will increase slightly from 0.5% a year to 0.7% a year based on Council's intended District Plan changes, known future developments and proposed partnership projects.[12]	Possible/Moderate	Medium	Moderate	Housing has been identified as a potential constraint to growth. Failure of responses to increase the supply could limit future population growth. Council would need to consider alternative responses.

[12] Rationale report "Murihiku Southland Housing Needs Assessment", May 2023, p26

ECONOMIC	Likelihood	Certainty	Consequence	Council Response
Economy CPI Inflation will peak in June 2023 and stay above 3% until 2025/2026.[13] Employment is expected to weather any recessionary conditions fairly well but unemployment is expected to increase nationally.[14] A short term dip is forecast for the early years of the plan with stronger growth in professional and highly skilled occupations.[15]	Moderate/Likely	Medium	Moderate	Inflation increases would have significant impact on budgets. Council would need to consider changes to services and/or the financial strategy. If LGCI inflation was 0.5% higher than forecast this would increase Council operational costs by $0.5 – $1.5 million per annum for the first 3 years of the plan. Council capital costs would increase by $0.3 - $1.5 million per annum for the first 3 years of the plan Increases in operational costs would impact the expected rates increase in those future years.
Community funding Despite recent economic challenges, Community Trust South and the Invercargill Licensing Trust Group have managed to return their funding levels to pre Covid-19 levels. This is anticipated to take some pressure off Council's funding pool.	Likely	High	Minor	Council will continue to liaise with other funding partners, including to monitor forecast security of investment, to assist control of this risk.

[13] Infometrics report "Economic update for Long Term Planning for Invercargill City Council", April 2022, p11
[14] Infometrics report "Southland Region forecasting scenarios for Beyond 2025 Southland", June 2023, p15
[15] *Id.* p15-18

Economic diversification Volatility in the global economy may affect one or more of Invercargill's key export industries. This will drive diversification but will slow growth. Employment growth in new industries such as aquaculture and green hydrogen is not expected to offset any declines in agriculture.[16] There may be a delayed effect through the risk of impacted industries abandoning properties. Growth in the forestry industry as a result of carbon farming has the potential to negatively impact Invercargill's economy.[17]	Possible	Low	Moderate	Council will continue to work closely with the Regional Council, Great South, the Chamber of Commerce and other stakeholders to support economic diversification for the region. In the case of significant industry decline a targeted response may need to be developed. The financial impact of this assumption is on the city's rating base, infrastructure network needs and the community's rates affordability. Changes in this assumption are not expected to be sharp shocks and as a result we will be able to flex annual plans and future LTPs to take account of these changes. At this point in time we do not expect this to have a significant effect on financial modelling for Years 1-3 of this Long Term Plan.
Central Business District The City Block development has been successfully completed and has attracted new development, including two new hotels in the city centre. Council will continue to support initiatives to drive the success of a thriving CBD. GDP will increase by	Likely	High	Moderate	Council remains strongly committed to its vision "Our City with Heart – He Ngākau Aroha." Any divergence from this vision could impact the financial viability of ICL but is not expected. Further investment may be required either in the City Block

[16] Beyond 2025 Southland Regional Long Term Plan, p20-21
[17] *Id.*, p20

$14m annually as a result of the investment until 2030.[18]				or associated city streets improvements.
Tourism Tourism in the Visit Southland area is expected to increase to between 160% - 165% of pre-Covid levels by 2029.[19] Invercargill is expected to proportionally benefit from this increase and demand for accommodation to increase and to be met from within existing stock.	Moderate/Likely	Medium	Minor	Tourism, while important, is not currently a major driver of the Invercargill economy, although it has great potential to grow. Council may need to invest in further infrastructure if tourism grows faster than expected and manage any flow on impact on housing availability given housing constraints.
International education The numbers of international students studying at Southern Institute of Technology (SIT) | Te Pūkenga are not expected to return to pre-Covid levels until 2028 at the earliest.[20] The decline as a result of Covid would be compounded if there was a change in policy at Te Pūkenga with reduced focus on recruiting international students, and by reduced domestic competitiveness as a result of the likely end of the Zero Fees policy.	Moderate/Likely	Medium	Minor	International students and their families create significant demand for certain categories of housing, including city centre housing. Lower numbers of international students is likely be a factor in the trend of an increasingly aged population. Lower or higher than expected numbers of international students may require an adjustment in Council response to City centre strategy and/or other provisions/ partnerships impacting housing availability.

[18] NZIER report "Invercargill CBD regeneration", May 2023, p17
[19] Beyond 2025 Southland Regional Long Term Plan, p56
[20] Infometrics report "Economic update for Long Term Planning for Invercargill City Council", April 2022, p18

Climate change regulatory change Legislative change is expected to increase requirements, reflected in the Emissions Reduction Plan and the National Adaptation Plan, on businesses and Council with an impact on economic growth as yet unknown.[21]	Likely	Medium	Moderate/ Major	Council is working with the regional Climate Change Working Group to set a strategy for the region and action plan for Council. Further investment will be required in activities to reduce emissions and to better understand climate change risk to Council assets.

ENVIRONMENTAL	Likelihood	Certainty	Consequence	Council response
Mean annual and extreme temperature (days where temp. exceeds 25C) are expected to increase with time: By 2040: mean annual temperature increase of 0.5-1.0C with 0-10 more hot days per annum. By 2090: mean annual temperature increase of 0.7-3.0C, with 5-55 more hot days per annum.	Moderate	Low	Minor	Temperature increase while important has an indirect impact on Council operations, which are expected to be accommodated within Council plans. It is not possible to forecast the impact of climate change in more detail on the capital programme until more accurate data and modelling is complete.
Annual rainfall is expected to increase By 2040: +0-10% B 2090: +5-20% Increased frequency of high rainfall days, i.e. increase in intensity of rainfall.	Moderate	Low	Moderate/ Major	Increased intensity of rainfall is expected to result in increased flooding. Council has adjusted its stormwater asset profiles to plan for increased major flooding events but there remain significant areas of the network which have not yet been renewed. There are also impacts on efficiency of the Sewerage treatment system as a result of overflow from the stormwater system during high rainfall events. The Branxholme Water Treatment

[21] Ministry for the Environment "Implementing Aotearoa New Zealand's first emissions reduction and national adaptation plans", 2023

				Plant is designed to cope with rainfall events to the level forecast in the 2018 NIWA study and outlined in our assumptions. There will be no impact on quality but there will be a reduction in flow. Supply will be maintained but with possible water restrictions. Dependent on the Affordable Water Reform and Council's ongoing areas of responsibility, adjustment may need to be made the renewal programme. It is not possible to forecast the impact of climate change in more detail on the capital programme until more accurate data and modelling is complete.
Mean sea level is expected to rise By 2040: 0.2-0.3m By 2090: 0.4-0.9m	Uncertain	Low	Major	There remains significant modelling which must be completed at a regional level to attain an understanding of what sea level rise is likely and its potential impact. There are known risk areas including the Airport and Bluff which need further investigation. Council has invested in major infrastructure upgrades at Stead Street to increase protection for the city. Further work will be required on associated flood banks to maximise this investment. Environment Southland has responsibility for managing and maintaining the

				remainder of the city's floodbank network. It is not possible to forecast the impact of climate change in more detail on the capital programme until more accurate data and modelling is complete.
Natural disaster Extreme weather events are happening more frequently and this trend is likely to continue due to climate change. There is a 75% probability of the Alpine Fault rupturing within the next 50 years.[22]	Possible	Medium	Major/ Catastrophic	A major disaster which impacted Council's ability to operate at the same time that the community's need for disaster relief was required to be supported would require a major shift in strategy and operations. Council supports Emergency Management Southland to coordinate the response in such a situation. Council would fund response to a natural disaster primarily via debt.
Environmental renewal Council will invest to understand more about the levels of environmental damage at Ocean Beach and New River Estuary. It is possible that further investment in renewal will be required within the life of the infrastructure Strategy.	Likely	High	Moderate	There is potential significant investment required for contamination management. The scale of this work is as yet unknown. There is no forecast impact on water quality due to the location of the sites below the drinking water catchments.

[22] https://af8.org.nz

CULTURAL	Likelihood	Certainty	Consequence	Council response
Māori culture Māori culture has become more visible in the city since the time of the last Long-term Plan and will continue to become more visible.	Likely/ Almost certain	High	Low	Council is working closely in partnership with Mana whenua and would seek to manage impacts through this relationship.
Project 1225 Te Unua Museum of Southland will be built by December 2025, and open to the public in the second half of 2026.[23]	Almost certain	High	Moderate	The programme is on schedule and remains a primary focus of Council. The impact of delay on service delivery is low, however the reputational risk of late delivery is significant. Council continues to actively manage this project through the PMO.
Civic pride Resident pride in the city following the redevelopment has increased (in 2023 80% of people said they would speak more positively about the city)[24] and will continue to increase as new projects including Project 1225 are completed.	Likely/ Almost certain	High	Minor	Council sees both City Block and Project 1225 as major cornerstone projects to achieving of its vision – Our City with Heart – He Ngākau Aroha. The social and economic benefits are already being realised. Continued commitment to the strategy will be required for full delivery.

[23] www.project1225.co.nz
[24] Southland CBD Rejuvenation Community and Business Survey Report, March 2023, p9

Cultural activation An increase in activities and events reflecting the diverse culture of Southland will take place following Council investment in activation and private uptake of new facilities available.	Likely	High	Minor/Moderate	Activation is essential to leverage Council's capital investment in the city centre. Council will continue to explore a range of mechanisms to support activation in the community.

COUNCIL OPERATIONS	Likelihood	Certainty	Consequence	Council response
Water Reform[25] At present it is assumed that Council will retain three waters for the short term but that in the medium term a new structure such as a CCO is likely. This will result in a structural change for Council in relation to the ownership of assets and associated debt capacity. The services will continue to be delivered, but these will be provided by another party. This will include increased regulatory requirements as required by the new regulatory authority. There are a number of risks which may remain: • some services which are a priority to the community (e.g.	Likely	Medium	Major	Depending on the future structure the impact to Council operations is major but moderate for the city, as services will be maintained in any scenario. Water items are included within the Infrastructure Strategy. It is noted that further legislation to enable a possible CCO structure is yet to be passed.

[25] www.waterservicesreform.govt.nz/how-do-these-changes-affect-me/councils/ (retrieved 15/09/23)

alternative water supply) may not be a priority to the new entity. • Some assets which have multiple purposes and value to the community may be better held by Council – e.g. Water Tower • Loss of key staff through the transition may result in loss of local knowledge and expertise • Impact on Council budgets through loss of water revenue and transfer of debt which may not be appropriately met through the transfer.				
Legislative changes There will be changes to legislation that have an impact on how Council will provide services. These changes may affect Council organisational structure but not change the level of service received by the customer/ratepayer in the first three years of the plan.	Likely	Medium	Minor/ Moderate	Management will continue to engage with Central Government to ensure levels of service are maintained or improved and plan for changes in services in response to policy and regulation changes as they arise.
Consents Council will continue to carry out legislation-directed ordinary functions while factoring in an increase to required quality for consent conditions.	Likely	High	Minor/ Moderate	Consent processes at Bluff and Clifton Water Treatment Plants have commenced, although under an increased level of uncertainty as a result of the reform programme. Any impact on the consent process as a result of this uncertainty would be significant.

The Funding Assistance Rate (as advised from Waka Kotahi) NZTA will continue at 51% funding assistance until 2026/27. It is assumed that it will then remain at 51% for the life of the plan.	Likely	Low	Moderate	Significant changes would have an impact on Council's ability to maintain levels of service and may require changes to budgets. Council continues to work closely in partnership with Waka Kotahi to manage this risk. If the FAR (Funding Assistance Rate) rate decreased by 1%, there would be reduction of subsidy revenue of $0.2 - $0.3 million per annum If the funding was replaced with rates revenue, an additional 0.30% rates increase would be required each year. If the funding was replaced with borrowings, an additional 0.02% rates increase would be required each year to pay for interest and repayments and borrowings would increase by $0.2 - $0.3 million per annum. Capital and operational programmes would need to be reviewed if funding was not available.

Asset life Assets will remain useful until the end of their average useful life, noting this requires underlying assumptions regarding asset condition to be correct. Infrastructure installed in the 1920s is nearing end of life and require renewal within the term of the Infrastructure Strategy.	Moderate/Likely	High	Moderate	Assets may need to be renewed earlier if this underlying assumption is incorrect. This may also change the renewal profile or may allow delayed renewal in other cases. Council will review the remaining asset life at each of the triennial asset revaluations and undertaken regular asset condition assessments.
Infrastructure network development It is anticipated that a 1% extension of the network (roading, three waters) will be required to service forecast growth needs of business and/or residential property. Locations are not yet known so more accurate forecasts are not possible.	Uncertain	Low	Moderate	Invercargill has not operated under a growth assumption in the immediate past as the network was constructed to support a higher level of population. However, new potential industries are expected, if they eventuate, they are likely to create significant new demands on the network. As a result Council is planning for this uncertainty by allowing for growth. The additional cost would be met via contractual financial contributions, reprioritisation of the capital programme and if necessary an increase in the budget provided for the capital programme. At present our capital programme is on average $80 million per annum. We expect that this may increase the capital programme by approximately 5% per annum.

Capital programme delivery 100% of roadmap and strategic projects are expected to be delivered. 80% of the core capital programme will be delivered in Year 1 and 2, 85% in Year 3, and 90% thereafter, following implementation of the Affordable Water Reforms. Pipe renewals are expected to be delivered at 70%.	Possible	Low	Moderate	Council continues to invest in enhanced project management capacity and supporting construction sector capacity through new ways of working. The financials will be reforecast to reflect the delivery expectations each year. The financial impact this assumption not being met is the deferral of capital expenditure until later years, higher risk of asset failure meaning assets will be sweated longer and repairs and maintenance will increase and emergency rather than planned replacement may become more frequent.
Investment Property & Biological assets Investment Property **&** Biological assets are valued on a yearly basis. They are expected to increase in value in line with inflation. This is reflected in our Financial Strategy, and Accounting policies.	Likely	High	Low	Variations in valuations have no cash flow implications for Council. Council will continue to value Investment Property and forestry assets on an annual basis.

FINANCIAL	Likelihood	Certainty	Consequence	Council Response
Rating base growth Rating base growth in line with population growth, household size changes and industry growth of 0.9%	Likely	High	Moderate/Major	The Rating base forecast is fundamental to the forecast revenue Council expects. A lower than expected level of growth would require Council to adjust rates or expenditure through the Annual planning process.
Inflation Operational forecasts and capital work programmes will increase by the accumulated Local Government Cost Index inflation forecast by BERL, being 2.9% for operational and 3.0% for capital in 2024/2025.	Likely	Medium	Moderate	Cost change factors are based on information developed for councils by BERL. Significant variations to inflation would have an impact on Council's financial management. The significant changes in recent years in relation to inflation mean that level of uncertainty has increased as to whether increased fluctuations in the BERL cost estimates can be expected. Council will continue on the planned pathway for the Capital Works programme and review operational revenue and expenditure each year. If inflation was 0.5% higher than forecast this would increase Council operational costs by $0.5 – $1.5 million per annum for the first 3 years of the plan. Council capital costs would increase by $0.3 - $1.5 million per annum for the first 3 years of the plan

				Increases in operational costs would impact the expected rates increase in those future years.
Asset revaluation Asset values will increase by the accumulated Local Government Cost Index inflation forecast by BERL on the last valuation value. Revaluation occurs in 2024/25 and every third year thereafter.	Likely	Medium	Moderate/ Major	Changes in valuation (cost price) or life of Council assets have a significant impact on Council's financial management and capital programme. Council will continue on the planned pathway for the Capital Works programme and monitor after each revaluation cycle. If revaluation values was 0.5% higher than forecast this would increase Council Property, plant and equipment revaluation gain / (loss) by $0.5 million in 2024/2025.
Depreciation rates on planned asset acquisitions Buildings 2.4% Hard surfaces and appurtenance 6% Intangible assets 32.8% Investment property buildings 0% Library collections 16% Monuments and statues 0% Motor vehicles 29.3% Plants and equipment 23.5% Restricted buildings 0% Roads, bridges and footpaths 3.5%	Likely	High	Low	Regular reviews of appropriate rates incorporating asset life and value data are undertaken as part of the asset revaluation process.

Stormwater systems 1.5% Wastewater Other Assets 1.4% Wastewater treatment plants 6.4% Water other assets 2.1% Water treatment plants 2%				
Interest rates - Borrowing Expected interest rates on borrowing will be 4.0%	Moderate/Likely	Medium	Moderate	A significant change in interest rates and the cost of borrowing would have a significant impact on Council budgets. Changes to services or the Financial Strategy would need to be considered. If interest rates was 0.5% higher than forecast this would increase Council finance expenses by $0.8 – 1.1 million per annum for the first 3 years of the plan.
Interest rates - Cash and Deposits Return on cash and term deposits are forecasted to be 5.0% in Year 1, 4.5% in Year 2, 4.0% in Year 3.	Likely/ Almost Certain	Medium	Minor	Term deposit rates currently vary between providers but most providers have a discount on rates from their prime lending rates. If interest rates were 0.5% higher than forecast this would increase Council finance revenue by $0.3 million per annum for each of the first 3 years of the plan.
Dividends from ICHL Dividends will be minimum $5.2 million, plus an additional $4 million special dividend for the ten years of	Likely	Medium	Minor/ Moderate	There would be a negative impact on Council's overall revenue and cash position if the dividend level was not maintained, which would increase the burden on ratepayers.

the Long-term Plan, resulting in a combined dividend rate of $9.2 million.				Council will consider strategic reliance on dividend noting increased levels of economic uncertainty and impact of Council future direction to ICHL regarding holding of non-financial strategic assets.
External Funding It is assumed Council will achieve the level of external funding as estimated.	Possible/ Moderate	Medium	Minor/Moderate	Council is expecting external funding from Central Government, community and private investment into a number of strategic projects. While not all funding may be achieved, the estimates are based on expert analysis and are expected to be at least partially fulfilled. Council expects to be in a position to meet any shortfall.
Land Sale Revenue Revenue from the sale of land is forecast to amount to $2.2 million in 2024/2025, $1.6 million in 2025/2026, $10.6 million in 2026/2027, and $0.2 million in 2027/2028.	Possible/Moderate	Medium	Minor/Moderate	Some or all land may not be sold or may be sold for a lower value. Council expects to be in a position to meet any shortfall.

2.9.2 Other Assumptions

Additional specific assumptions which are considered in the thinking of this Plan include:

Table 2.10

Assumption Area	LTP Assumption
Technology	Electronic Vehicles (EV) increased uptake will require us to consider whether mode change and a shift active transport is still required. Significant numbers of autonomous vehicles will be developed and introduced into the traffic fleet improving safety but not until 2037 or later. E-bikes and e-scooters are a more frequent choice of commuters, including of minors to schools. Camera technologies will become a more commonly used tool for stakeholders. Safety features are now a feature in affordable mainstream vehicles.
Mobility	The community will engage in mode shift and non-vehicle travel trips will grow as climatic awareness and economic constraints grow.
Safety	An improvement in all modes safety will occur in Invercargill before 2030 and residents will agree investment in their safety is a priority.
Ageing Population	Changing population demographics and technology will increase demand for mobility solutions, however asset availability and core service delivery are unlikely to be significantly affected.
Local Economy	Freight and the traffic still use the traditional roads.
Tourism and Visitor Numbers	Visitor numbers do not adversely influence the road safety issues.
Useful Life of Significant Assets	Data accuracy utilised in analysis continues to improve and is reliable.
Financial	Funding from Waka Kotahi and future NLTF programme is constrained and will likely not meet expectations for revenue required for the network.

As assumptions deal with matters of uncertainty and complexity, actual results will likely vary, but are based on the best information available. If actual future events differ from the assumptions, it may result in material variances to this Plan. The Long Term Plan Background and Assumptions 2024-2034 document identifies the risks that underlie those assumptions, the reason for that risk and an estimated potential impact if the assumption is not realised.

2.9.3. Key Messages

Key Messages – Assumptions

- There are many assumptions to consider in the AMP
- They relate to factors such as population, demographics, social trends, the economy, freight, travel trends and modal choice, technology, climate change, the environment, and data associated with the assets
- These are assessed in terms of their level of uncertainty and impact on the financial programmes in later sections

3. The Service We Provide

This section defines the services that Council delivers to its customers and the measures used to assess Council performance in delivering them.

The ONF framework defines five Customer Outcomes that are relevant to our levels of service: healthy and safe people, resilience and security, economic prosperity environmental sustainability and inclusive access. The expected customer experience for each road classification is defined by nationally agreed ONF measures and those which Council directly establishes and sets.

The ONF is a framework which provides a consistent means of investing in the right thing at the right time and the best price. The community needs to understand this framework as it is a strong basis for co-investment by Waka Kotahi and where the community wishes to consider alternative levels it may need to provide the appropriate additional funding for this.

Levels of Service are linked to the Southland Regional Land Transport Plan, Council Community Outcomes, and the Government Policy Statement (GPS 2021).

3.1 CUSTOMER PROFILE

3.1.1 Our Stakeholders and Community

The roading activity has a wide range of internal and external stakeholders, which include customer groups. The following have been identified as key stakeholders, who have needs and expectations and with whom we engage in order to better understand these.

Table 3.1 Our Stakeholders and Community

External Stakeholders	Area of Interest	Engagement	Customer Needs and Expectation
Invercargill City ratepayers	Rates impact	Customer surveys	Value for money
Transport network users: • car drivers • Active Transport ○ cyclists ○ pedestrians ○ e-mobility • Trucks and commercial users • Disability sector	Network performance Network safety	Surveys	Safe, resilient, reliable and accessible Network Amenity (smoothness) Areas for Community Access (Community/Play Streets)
Council contractors	Network performance, safety for teams	Liaison	Safe road network to work on
Utilities – Chorus, Powernet, etc.	Network Management of Corridor access and programming	Liaison	Safe and accessible Network to manage assets
Transport and Freight Operators, Road Transport Association, AA	Network safety, efficiency and time reliability, access to properties, resilient and smooth networks	Liaison	Safe, resilient, reliable Network, predictable travel times
Waka Kotahi	Network performance and safety outcomes, network standards,	Direct liaison	Safety, Mobility, Amenity, Accessibility,

External Stakeholders	Area of Interest	Engagement	Customer Needs and Expectation
	subsidy funding levels, value for money		Resilience, Cost Efficiency
Business and commerce	Network efficiency and reliability, Amenity Values	Liaison	Safe and accessible Network, value for money, resilient.
Passenger Transport Operators	Network performance and safety, reliability	Liaison	Safe, reliable and accessible Network
NZ Police	Safety Outcomes, Access, Resilience	Direct liaison	Safe, reliable and accessible Network
Environmental Groups	Operational Outcomes, resilience and amenity	Consult	Amenity for people and places, resilient
Southland District Health Board, MoH, MoE	Health, Environmental and Recreation Issues	Consult	Safe Network for all modes of travel
Audit New Zealand	Governance and Operation	Audit	Value for money
Other Councils	Cross Boundary Journey consistency	Liaison	Accessible and resilient Network

Internal Partners and Stakeholders	Area of Interest	Engagement	Customer Needs and Expectations
Councillors, CE and Group Mangers	Governance, value for money	Reporting	Safety, Mobility, Amenity, Accessibility, Technical Outputs, Cost Efficiency
Iwi – Waihopai and Awarua	Environmental Operation	Liaison, Partnerships	Resilient network, amenity values, environmental
Council Activity Managers	Activity coordination, Accessibility, Resilience	Liaison	Safe and accessible Network, Resilience
Engineering Services	Technical and Operation	Reporting	Safe and accessible Network
Finance and Corporate	Financial Performance Corporate Service Support, Value for Money	Reporting and business support	Value for money

3.1.2 How We Engage our Communities

Council engages the community on transport and road activities via:

- Longterm Plan Consultations
- Regional Land Transport Plans, Government Policy Statement GPS (for Transport), Arataki – Waka Kotahi NZ Transport Agency Long Term Strategic View
- Public Forums at Committee Meetings
- Newspaper articles, rates newsletters and media statements
- Mayoral appointments with residents
- Formal consultation through the Special Consultative Process
- Service Request via Council's website, Facebook and similar mediums
- Community – Have your say sessions
- Residents surveys
- Letters to affected parties for projects
- Speaking to community and industry groups
- Participating in industry forums

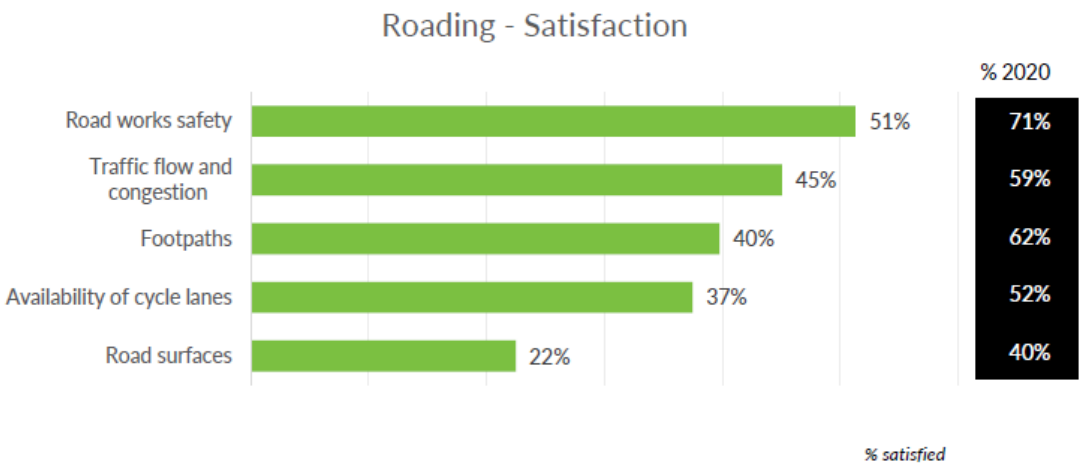
- Signs and billboards

3.1.3 Community Research

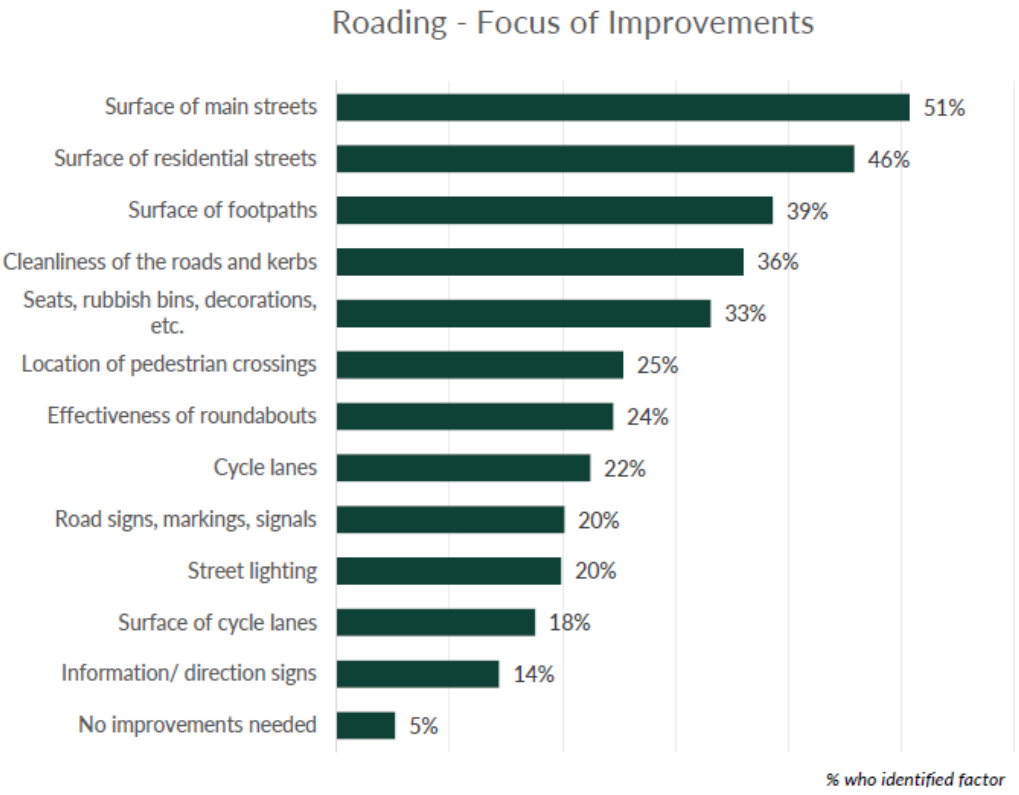
Invercargill City Council conducts yearly surveys of its residents..

However, research from the previous financial year showed that:

- Roading, along with sewerage, water, stormwater, solid waste management and parks and reserves were considered 'important' by at least 80% of residents.
- Roading was an area most residents would like to see additional funding allocated to (41% indicated Council should spend more on roading and only 6% preferring a lower level of expenditure). This was highly rated in 2020 too (at 44%)
- When asked about sources of funding for roading, the most commonly identified source of funding was the government, followed by a reallocation of rates.
- When residents were asked to consider issues related to roading, the greatest level of satisfaction was with safety at road works (51%), followed by satisfaction with the level of traffic flow and congestion (45%). The factor with the lowest level of satisfaction was road surfaces (22%).
- Nearly two-thirds (64%) of Invercargill residents felt safe when driving on the roads. Fewer (52%) felt safe as a pedestrian, while only 27% of those who cycled felt safe on the city's roads.



In terms of improvements, 51% of residents indicated the surface of main streets should be improved, followed by surface of residential streets by 46% of residents. Footpath surfaces were also an issued for 39% of residents.



The survey methodology changed during the 2022/23 financial year and the core survey questions no longer includes roading-specific questions. However, each quarter, there is the option for additional questions on a particular topic and the Roading Activity will be considered for this.

Customer service requests are also logged corporately and this information is another platform which can be used to understand community requirements and where demand is growing or issues of concern are developing.

The Problem Statements in Section 2 have been reviewed and updated to include understandings gathered over the last three years.

Many customers drive State Highways through the City and Council receives many requests for their improvement. The survey may be impacted by this input which is typically not tested.

3.1.4 Key Service Attributes Valued by Customers

Customers see the most important aspects of the roading activity as:

- Connected reliable roads and streets safe for all modes of transport.
- Council advocating, promoting and delivering programmes which support access and mobility for the community.
- A road network which is reliable and resilient from storms, natural hazards or the effects of climate change.
- Roading programmes and changes to assets encouraging a shift from car use to walking and cycling.
- Accessible footpaths for use of many transport modes (walking, mobility devices, scooters) with suitable access to properties to support our changing population demographics.

- A City Centre which encourages people to visit and stay through having place functionality.
- A Council where environmental issues are considered when making choices and decisions.
- Roads with clear road signs, markings and traffic signals.
- A heart of Invercargill to be proud of that is well maintained, clean and safe.
- Streets and roads which drain after rain and are free from debris.
- Enough street lighting to feel safe.
- Car parking easily available, easy to use and appropriately priced.
- Roads assigned for high traffic use which trucks should use, operating efficiently and reliably with access through the city, paved and lit appropriately.
- Unsealed roads which have less dust and are not potholed or corrugated.
- Passenger Transport system where routes enable access and travel, at times, frequency and cost appropriate to community expectations.
- An effective Mobility Scheme where the disability sector is supported and encouraged to travel.
- Infrastructure to support Passenger Transport and Total Mobility.
- Improved CCTV capability

These attributes are well connected to the ONF Customer Outcomes and the Regional Public Transport Plan (RPTP) as shown in the next section. They are also well connected to the Council's key issues of Climate Change, Demographics and the CBD.

3.2 SERVICE DRIVERS

3.2.1 Community Expectations

Our community expectations can reflect the ONF outcomes as shown below:

Table 3.2 Community Expectations

TOF	Benefit Cluster	Benefit	Short Benefit Definition
Healthy & Safe People	1. Changes in user safety	1.1 Impact on social cost of deaths and serious injuries	The impact of reducing the number of deaths and serious injuries (DSIs) on the all land transport modes and their social costs.
		1.2 Impact on a safe system	Investment that contributes to an overall improvement in a safe system for all users of all modes. Alongside system-wide infrastructure investment, the benefit also covers the regulation and policing of the land transport system for safety.
	2. Changes in perceptions of safety	2.1 Impact on perceptions of safety & security	User experience and perception of the system, particularly relating to safety and security. A sense of safety may be related to appropriate facilities, particularly for walking and cycling, and comfort with the perceived level of risk associated with travel. Perceptions of security can be associated with the physical attributes of a place (e.g. lighting, security cameras etc), protection from external threats (e.g. terrorist threats, public unrest and pandemics).
	3. Changes in human health	3.1 Impact of mode on physical and mental health	Impact of mode choice on transport users' physical and mental health. Often framed in relation to physical health benefits associated with uptake of active modes.
		3.2 Impact of air emissions on health	Land transport air emissions that impact on human health, limited to those arising from roads and rail.
		3.3 Impact of noise and vibration on health	Land transport noise and vibration that impacts on human health. Noise and vibration from construction, operation, maintenance and use of land transport infrastructure.
Resilience & security	Changes in impact of unplanned disruptive events on access to social and economic opportunities	4.1 Impact on system vulnerabilities and redundancies	Reducing the risk of communities not being able to access social and economic opportunities due to unexpected outages.
Economic prosperity	Changes in transport costs	5.1 Impact on system reliability	User being able to count on a similar travel experience on the transport system when travelling under the same conditions (for example at the same time with the same mode).
		5.2 Impact on network productivity and utilisation	Network productivity and utilisation is about efficient use of the land transport network. Optimising our part of the broader economic/social system to allow broader benefits to be gained.
	Wider economic impact (WEI)	6.1 Wider economic benefit (productivity)	Changes in productivity as the result of agglomeration where firms and workers cluster for some activities that are more efficient when spatially concentrated and benefits from economies of scale.
		6.2 Wider economic benefit (labour supply)	Changes in labour supply as the result of changes in commuting cost is the proportion of the additional output taken in taxation.
		6.3 Wider economic benefit (imperfect competition)	Transport improvement causes output to increase in sectors where there are price cost margins.
		6.4 Wider economic benefit (regional economic development)	Economic benefits from increased tourism activity are distinct from the wider economic benefits identified above.
Environmental Sustainability	Changes in natural environment	7.1 Impact on water	Impact on water quality, and flow during the operation, maintenance and construction of transport infrastructure.
		7.2 Impact on land and biodiversity	Impact of land transport system construction, maintenance, and operational use, on habitat fragmentation, connectivity, availability and quality of ecosystems and habitat, diversity of native flora and fauna, and biosecurity.
	Changes in climate	8.1 Impact on greenhouse gas emissions (GHG)	Land transport contribution of greenhouse gas emissions.
	Changes in resource efficiency	9.1 Impact on resource efficiency	Sustainable use of resources and materials and the reduction of environmental harm.

TOF	Benefit Cluster	Benefit	Short Benefit Definition
Inclusive access	Changes in access to social and economic opportunities	10.1 Impact on user experience of the transport system	How all people experience the transport system, including people with disabilities, school children, and the elderly, and how different modes are experienced.
		10.2 Impact on mode choice	The way that people make journeys, including the start and end of a person's journey, and the options they have open to them. It can also include freight mode choice.
		10.3 Impact on access to opportunities	The transport system as an enabler, focussing on economic and community participation and the importance of the destinations and services/activities that can be equitably accessed through transport, rather than the experience of travelling.
		10.4 Impact on community cohesion	The transport system's role in enabling and maintaining the normal functions of a community.
	Changes in liveability of places	11.1 Impact on heritage and cultural value	Spiritual/ cultural values are deeper experience of the place that transcends amenity associations and is distinct from commemorative associations.
		11.2 Impact on landscape	How the characteristics of the land and their perception generates a 'sense of place' or identity. Primarily about place, but the way people move through it, whether by vehicle or on foot, is also important to the sense of landscape.
		11.3 Impact on townscape	How the characteristics of the built / non-built urban environment and their perception generates a 'sense of place' or identity. Primarily about place, but the way people move through it, whether by vehicle or on foot, is also important to the sense of landscape.
	Changes in Te Ao Māori	12.1 Impact on Te Ao Māori	Incorporates both historical and contemporary evolving values that should be considered to understand the potential and realised benefit

However, there are a number of key concerns that compromise our ability to deliver the expectations in these areas – are summarised below.

Key Concerns relating to Community Expectations

- Invercargill's poor safety performance at intersections.
- Our customers' expectation gap for smoother roads is not generally accepted by our funding partner. Historically, Invercargill has had smoother roads than the national average.
- Parts of the CBD amenity is poor and with significant development underway, continued investment is required to meet expectations.
- CCTV community wish for further surveillance opportunities within the district

3.2.2 Legislative Requirements

The key legislation and Government policy documents relating to transport network management in New Zealand are summarised in the table below:

Table 3.3 Legislative Requirements

Legislation	Requirements	Impacts on LoS
Local Government Act 2002 Schedule 10, including 2014, 2019 amendments	Requires Council to prepare a Long Term Plan with specific requirements for content and a 30-year horizon.	Sets legal requirements for LoS. GPS sets direction for mode shifts and where funding support is appropriate.
Land Transport Management Act 2003 and subsequent amendments	Requires Council to contribute to an integrated, safe, responsive, and sustainable land transport system. Reflected through Arataki and the Government's Policy Statement on Land Transport.	Speed limits, establishes need for safe roads and cost effective delivery, to contribute to an effective, efficient, and safe land transport system in the public interest.
Invercargill City Council Bylaws – Traffic Control; Parking; and Land Subdivision	Sets expectations of the community for the standards of behaviour.	Establishes controls for road management for accessibility and safety.
Land Transport Act 1998	Controls aspects of road and traffic operations, including Traffic Regulations, bylaws, enforcement.	
Telecommunications Act 2001, Electricity Act 2010, Gas Act 1992, Railway Safety and Corridor Management Act 1992, Utilities Access Act 2010	Provide utility operators and others with powers to use road corridors.	Establishes safe road working and operating environment. Establishes process to manage how Roading assets are reinstated.
Health and Safety at Work Act 2015	Requires safe work places for all activities undertaken by local authority's staff, consultants and contractors.	Establishes the safe work environment requirement.
Public Works Act 1981	Enables compulsory land purchases and defines the procedural and informational requirements.	Empowers road corridor management rules.
Resource Management Act 1991 and subsequent amendments	Requires Council to sustain the natural and physical resources and comply with the District and Regional Plans. It also requires Council takes into account the principles of the Treaty of Waitangi in exercising functions and powers.	Establishes land use rules.
Civil Defence and Emergency Management Act 2002	Sets requirements for lifeline utilities (ICC Roading) to be able to function during an emergency event.	Influences resilience LoS
Climate Change Response Act 2002 and subsequent amendments	Provides a framework by which New Zealand can develop and implement clear and stable climate change policies.	Influences the supply of services and assets for PT and active transport, and means to reduce GHG.

.2.3 Industry Standards and Guidelines

The following documents are generally accepted as industry practices:

Table 3.4 Industry Standards and Guidelines

Category	Standards and Guidelines	Impacts on LoS
a. Pavement and Surfacing	Austroads Guide to Stabilisation in Roadworks, 1998	Sets technical specifications and best practice
b. Pavement Design	New Zealand guide to pavement structural design 2018 Austroads standards: Rural road design; "Guide to Geometric Design of rural Roads Austroads. Guide to road design – Part 3: Geometric design	Sets technical specifications and best practice
c. Traffic Management	NZTA Code of Practice for Traffic Management (CoPTTM)	Establishes rules for operating safely in the network
d. Street Lighting and Traffic Signals	SA/NZS 1158.6:2015 Lighting for roads and public spaces Part 6 Luminaires - Performance NZTA M30:2014 Specifications and Guidelines for Road Lighting Design NZTA P43 Specification for Traffic Signals:2020 Austroads Guide to Traffic Management Part 9: Transport Control Systems – Strategies and Operations: 2020	Establishes appropriate lighting levels for safety
e. Pedestrian Planning	Pedestrian planning and design guide, Wellington : NZTA 2009	Establishes best practices
f. Signs / Roadmarking	NZTA Traffic Control Devices Manual:2008 NZTA Guidelines for marking multi-lane roundabouts:2010	Establishes best practices
g. Cycle network	Austroads, Guide to Road Design Part 6A: Paths for walking and cycling 2021	Establishes best practices
h. Safety	NZTA Safe System approach to road safety for system designers:2012	Establishes best practices
i. Bridges and culverts (structures)	NZTA Bridge manual (SP/M/022):2013	Ensures standards for resilience, access and safety
j. Maintenance Management Systems	RAMM Road Condition Rating and Roughness Manual, Transfund, 1997 (part 3 to 5)	Establishes measurement for measuring data for access and cost approaches
k. New Zealand Transport Agency Specifications	Waka Kotahi NZ Transport Agency standards and guidelines register for land transport | Waka Kotahi NZ Transport Agency (nzta.govt.nz)	Establishes best practices
l. New Zealand International Infrastructure Management Manual	Asset Management Practice	Establishes best practices
m. NZS 3910, 3915, 3916 & 3917	Contract Documentation for tendering	Establishes best practices
n. NZTA Procurement	NZTA Manual in conjunction with ICC Procurement Strategy informs how to procure	Establishes procurement process

Category	Standards and Guidelines	Impacts on LoS
Manuals	and evaluate tenders	to gain best cost approach
o. Subdivisions	NZS 4404:2010 Subdivisional standard read in conjunction with Council Bylaw	Sets standards for assets
p. Urban Street planning and design	Aotearoa urban street planning and design guide	National and international best-practice to provide a framework for well-functioning urban environments

3.3 LEVELS OF SERVICE

3.3.1 Alignment of Customer Levels of Service with Community Outcomes

The Roading Activity supports Council's outcome for economic wellbeing **a by delivering innovation and partnership and the appropriate infrastructure** through maintaining the average quality of ride on a sealed local road network, measured by smooth travel exposure, both urban and rural (DIA2), and maintaining the percentage of the sealed local road network which is resurfaced (DIA3).

The Roading Activity monitors the total number of fatal and serious injuries each year on the network (DIA1). The activity also measures and reports on a number of technical measures to Transport Insights which consolidates performance nationally on the performance of each Road Controlling Authority for comparative analysis.

The Roading Activity supports Council's outcome for social wellbeing by ensuring vandalised signs (ICC1), traffic signal failures (ICC2) and requests for service (DIA5) are responded to in a timely manner and through maintaining footpath conditions (DIA4) and street lighting (ICC1).

The following table outlines how the Levels of Service align with the contribution of the activity to achieving the outcomes as described above.

Table 3.5 Alignment between Customer Levels of Service and the Outcomes

COMMUNITY OUTCOME	MEASURE 2024-2034	TARGET
A vibrant, safe city centre which meets our people's diverse cultural needs.	The number of and change from the previous financial year in the number of fatalities and serious injury crashes on the local road network, expressed as a number (DIA 1)	Decreasing annually
One Community – Our youth, older people, different neighbourhoods and communities' basic needs are met, and they feel valued and proud to live here.	The average quality of ride, on a sealed local road network, measured by smooth travel exposure (DIA 2)	Higher than the previous national average: Urban – 82.6% Rural – 92% (in 2022/23)
A future focused economy delivered through innovation and partnership and supported by appropriate infrastructure.	The percentage of the sealed local road network that is resurfaced (DIA 3)	> 6.25% (2019) ; > 5.5% (2021 →)
A future focused economy delivered through innovation and partnership and supported by appropriate infrastructure.	The percentage of footpaths within the district that fall within the level of service, or service standard for the condition of	< 8% in very poor condition

	footpaths as set out in the Asset Management Plan (DIA 4)	
One Community – Our youth, older people, different neighbourhoods and communities' basic needs are met, and they feel valued and proud to live here.	The percentage of customer service requests relating to roads and footpaths, to which the territorial authority responds within the time frame specified in the Long Term Plan (DIA 5)	75% of requests are responded to in five or less business days

3.3.2 Customer Levels of Service

The following tables outline the Levels of Service for roading to measure and report on annually to demonstrate the performance which is being achieved. These measures are established to provide a view of the activity which stakeholders can easily understand and be able to assess if the correct efforts are being input and delivered.

DIA Measures – Customer Levels Of Service

The Department of Internal Affairs (DIA) requires councils to report on a number of mandatory performance measures. These measures cover the following key aspects of service delivery:

1. How safe are the local roads?
2. What is the overall condition of sealed roads in the local road network?
3. Is the sealed roads network being maintained adequately?
4. Are the footpaths that form part of the local road network being maintained adequately?
5. Does the local authority responsible for the service provide a timely response if there is a problem?

Only a local road network must be reported on using these measures, providing information on the levels of service delivered by local government.

Table 3.6 Mandatory Measures (DIA) – Customer Level Of Service

No	Measure	Baseline
DIA 1	The change from the previous financial year in the number of fatalities and serious injury crashes on the local road network, expressed as a number.	Decreasing annually
DIA 2	The average quality of ride on a sealed local road network, measured by smooth travel exposure.	Higher than the Previous National Average
DIA 3	The percentage of the sealed local road network that is resurfaced.	The sealed area of surface is more than >= 5.5% of total surfaced area
DIA 4	The percentage of footpaths within a territorial authority district that fall within the level of service or service standard for the condition of footpaths that is set out in the territorial authority's relevant document (such as its annual plan, activity management plan, asset management plan, annual works program or long term plan).	Less than 8% in very poor condition
DIA 5	The percentage of customer service requests relating to roads and footpaths to which the	75% of requests are responded to in five or

	territorial authority responds within the time frame specified in the long term plan.	less business days

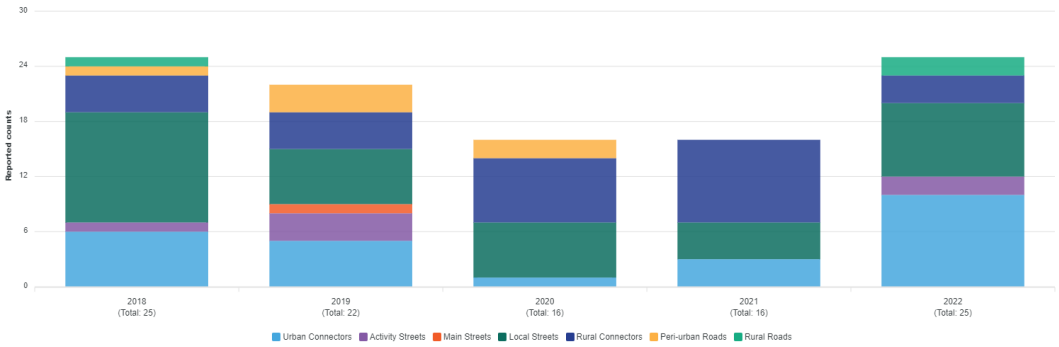
3.3.3 How Did We Measure Up in the Last Year

The following table lists those performance measures that were reported for Roading for the 2022/23 year:

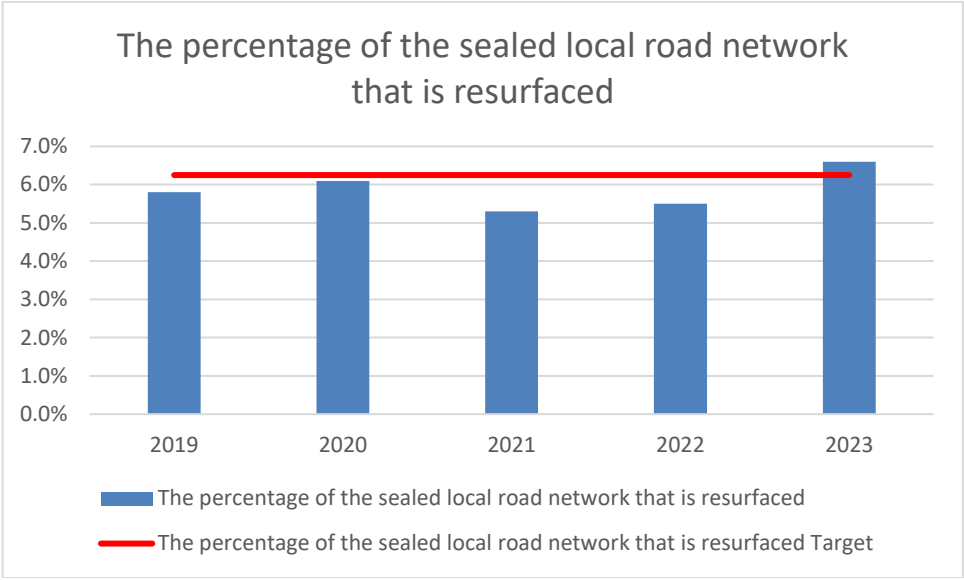
Table 3.9 Performance Reporting for Roading

No	Measure	Target 2022/23	Result 2022/23
DIA 1	The change from the previous financial year in the number of fatalities and serious injury crashes on the local road network, expressed as a number.	Decreasing annually.	Not Achieved – 17 crashes - 1 fatality, 17 serious injuries (2021/22– not achieved 15 - 2 more than previous year (4 Fatalities, 18 Serious Injuries))
DIA 2	The average quality of ride, on a sealed local road network, measured by smooth travel exposure.	Higher than the national average. Urban – 82.6% Rural – 92.0%	Achieved: Urban – 83% Rural – 96% (2021/22 – achieved: Urban 85%, Rural 98%)
DIA 3	The percentage of the sealed local road network that is resurfaced.	>5.5%	Achieved: 6.6% (2021/22 – not achieve: 5.5%)
DIA 4	The percentage of footpaths within the district that fall within the level of service, or service standard for the condition of footpaths as set out in the Asset Management Plan.	< 8% in very poor condition	Achieved – 1.8% in very poor condition (2021/22 – achieved: 0.5% in very poor condition)
DIA 5	The percentage of customer service requests relating to roads and footpaths, to which the territorial authority responds within the time frame specified in the Long Term Plan.	80% of requests are responded to in five or less business days	Achieved – 83% (2021/22 – not achieved: 78%)

The target reduction in the annual number of fatalities and injuries was not achieved when reported from the ONF reporting tool, however annual changes are not necessarily representative of a trend over several years. The one year trend may be up but the five year trend shows an overall decrease which is hopeful is for road safety. Council has seen a decrease in DSI on most road categories, with urban and rural connectors with increasing numbers. Furthermore, crash data is based on calendar year not financial years due to the reporting of statistics into the national CAS database.



The percentage of roads surfaced is a long term target and whilst achieved the result does not show a significant under-investment has occurred over the past 5 years.



The response to customer feedback is improving.

3.3.4 ONF Technical Levels of Service

ONF was developed through consultation with the industry and a wide range of measures has evolved. These include technical measures which are believed to assist the industry in understanding performance and the start of a basis for comparison.

These technical measures have been produced by the Te Ringa Maimoa - Road Efficiency Group as standard measures for New Zealand.

Council staff have however assessed current performance and established indicative and suitable targets. These targets will be assessed as appropriate in future years as most of these metrics have yet to be regularly captured.

The Technical Levels of Service are outlined in the table below and are not intended to be reported on.

The performance reporting tool should provide an opportunity to gather better performance data in future years and enables comparisons with peer groups in providing evidence to support changes in the business case.

ONF Measures – Technical Levels Of Service

These are measures which this plan considers as appropriate with a baseline assigned, although ONF has no set targets for these

Table 3.7 ONF Measures

No	Measure	Baseline	
	Healthy and Safe People		
ONF 1 (DIA 1)	The number of deaths and serious injuries	Decreasing annually	
ONF 2 (DIA 1)	Collective risk (crash density) – fatal and serious injury rate per km of road	Decreasing annually	
ONF 3 (DIA 1)	Personal risk – average annual fatal and serious injury crashes per 100 million vehicle-kilometres	Decreasing annually	
ONF 4 (DIA 1)	The number of death and serious injury crashes contributing factor is intersections	Decreasing annually	
ONF 5 (DIA 1)	The number of crashes involving vulnerable users: • Bicycle • Equestrian • Moped • Motorcycle • Pedestrian crossing road • Wheeled pedestrian • Other pedestrian	Decreasing annually	
	Inclusive Access		
ONF 6 (DIA 2)	Smooth Travel Exposure – percentage of travel on smooth roads that is smoother than the threshold by traffic volume: • <500 • 500-999 • 1000-3999 • 4000-9999 • >=10000	Urban <=180 <=150 <=150 <=120 <=110	Rural <=150 <=150 <=130 <=130 <=130
ONF 7 (DIA 2)	Peak Roughness – of road by Street Category (85th Percentile, higher the roughness number the rougher the ride):	Lower than National by Street Category (2023). Urban Connector – 118 Activity Street – 133 Main Streets – 129 Local Streets – 164 Rural Connectors – 99 Peri-urban Roads – 119 Rural Roads - 118	
	Economic Prosperity		
ONF 8	Percentage of network available to: • Class 1 Heavy	Stable to improving annually	

	• HPMV • 50 MAX Vehicles.	
ONF 9	The overall cost per km and Vkt of routine maintenance activities, and cost by work category on each road network for the financial year for: • Drainage • Pavement • Surfacing	<= Peer Group Average
ONF 10	Sealed Road and Pavement Rehabilitation and Resurfacing • Rehab ▪ Length and Area ▪ Cost and Average Life • Chip seal Rehab ▪ Length and Area ▪ Cost and Average Life • Asphalt Rehab ▪ Length and Area ▪ Cost and Average Life	<= Peer Group Average

3.4 LEVELS OF SERVICE ISSUES AND CHALLENGES

The challenge for Roading is to align with the ONF Performance Measures going forward and to be able to cost effectively capture performance data in ways which do not require too much additional effort. The results must be available for use and be meaningful, otherwise a lack of confidence in performance data may reflect in a poor understanding of outcome achievement.

The current service level measures remain relevant, although targets will be established for some ONF measures and then reassessed in light of further information.

3.4.1 Current Levels of Service Gaps and Possible Responses

The following summary notes perceived gaps in the levels of service planned to be delivered by this Plan, and identifies potential responses to addressing the gaps. It includes the gaps relating to the GPS highlighted in the Strategic Case Summary (Section 2.8) and expands on the strategic responses.

Table 3.10 Current Levels of Service Gaps and Possible Responses

LoS Measure	Gap	Response Approach	LoS No
Road Safety Number of fatal and serious injuries *(GPS Gap)*	Community at Risk Register worsening trend in statics for Intersection, young drivers, driver distraction, cyclists and	• Revisit if the Southern Road Influencing Project has value at a regional level ○ Develop a Collaborative Relationship Management Plan ○ Develop a Community Engagement Strategy and Plan	DIA 1 ONF 1

LoS Measure	Gap	Response Approach	LoS No
	older road users, also worst in comparison to peers. Overall longer term trend is reducing but some years LoS have not been achieved	• Participate in the Road to Zero programmes from Waka Kotahi • Have programmes with Waka Kotahi and use the Road Safety Promotions activity to promote better behaviours • Strengthen the delivery of programmes through Road Safety Southland Shared service with SDC and GDC • Develop a strategy for Road Risk Management including speed reduction street treatment • More localised traffic design • Network management to reduce operating speed and risk areas • Develop Active Transport Strategy and Network Plan for future improvements • Develop and Implement a Road Safety Action Plan • Develop Network Operating Framework and Future Network Strategy and Plan for a reduction in modal conflict • Improve data collection and analysis • Budget to enable minor improvements programme	
Smooth Travel Exposure (STE)	Roads not smooth enough – increasing issue	• Localised treatments driven by roughness data • Better political understanding – better than others • Maintenance works targeted at ONF hierarchy and specific issues • Ensure that compliance of others work in our network are complying with Council requirements.	DIA 2 ONF 6
Road Surfacing Programmes	Programmes less than long run average target	• Optimised modelling (JunoViewer) to predict long term approach and FWP developed and used for future plans • Close onsite monitoring and validation of modelling • Do the right treatment at the right time – rather than birthday sealing • Plan better and align works with utilities • Improve data accuracy to establish appropriate programmes	DIA 3
Climate change *(GPS Gap)*	Greenhouse gases and amounts of pollution from transport are	• Develop and implement Council policies and targets to support reduction in greenhouse gases • Refine CO^2 emissions calculations	NA

LoS Measure	Gap	Response Approach	LoS No
	continuing to increase Adaption	• Understand where Roading can adapt to adjust for Climate Sustainability and Resilience	
Freight connections *(GPS Gap)*	Climate change may affect freight routes in the future Current use of network by freight traffic conflicts with other users	• Potential climate change disruption impacts need to be better understood • Need to better understand current patterns of network use by freight trucks and nature of potential conflicts with other road uses and communities • Develop an agreed Network Operating Framework (NOF)	ONF 9
Passenger Transport and Active Transport modes *(GPS Gap)*	Reducing PT patronage – mode share transferred from single occupant private vehicles to other modes is not increasing	• Investigate new PT routes potential • Provide better information for PT access • Investigate was to increase Active Transport use • Investigate on demand PT services type solutions for future contracts	
Dust Suppression and seal extensions	Customers are expecting dust levels to be reduced for health, safety and environmental reasons	• Management of grading, material use and methodologies (walk and roll) • Look to other technology (Otta Seals, dust suppressants) • Utilise policy to support decisions • Encourage Council and User investment for localised sealing • District Planning actions to limit households close to unsealed roads	N/A
Street lighting and ditches (Otatara / Bainfield Road)	Some ICC areas have grown and the rural standards are meeting customer expectations	• Need to investigate further to establish a baseline for this (brought to us by Councillor) • District Planning actions to limit households close to unsealed roads	
Carparking	Carparking suitably located to CBD	• Better information on problem, supported by surveys and data • Use of technology to support business needs • Review Parking now Central City developments (ICL) carpark is completed • Recognise value in parking and manage perceptions • Buy and develop suitably located carpark through on street funding charges	Other TBC

LoS Measure	Gap	Response Approach	LoS No
		• Divest underperforming activities	

Council has historically noted and accepted that the expectation of customers may not always be aligned to funding constraints.

Further comments on the key gaps are noted below:

Safety

Safety is a key improvement area and a specific problem statement which is similar to other councils. This is recognised in the GPS and Waka Kotahi work category, Road to Zero. Programmes need to be coordinated to focus on issues and work towards solutions. Having a community where the number of deaths and serious injuries on roads is reducing is an essential priority. Better aligning to Road to Zero along with, a minor improvement and education programmes is a key opportunity for better outcomes.

Smooth Roads

Technical data such as STE shows that Invercargill has better roads than the national average but our smooth travel is trending downwards. This is not what the public perceive and is a gap which needs to be communicated. There will be a need to focus on and improve in particular in Urban and Rural Connectors, Local and Activity Streets.

Council must communicate better to stakeholders to ensure a more robust understanding is achieved between ONF national expectations (Te Ringa Maimoa - Road Efficiency Group and Waka Kotahi) and the community. It is important to ensure that ratepayers understand the ONF Technical Performance targets and how they are aligned to ONF requirements. This will give the community a clearer understanding of the wider approach and the opportunity to consider if they wish to invest further (in areas where Waka Kotahi currently also invest).

If there is a true community desire to have “smoother roads” and higher roading standards they will understand the commitment to fund these (given the current financial climate) and demonstrate that support does truly exist.

Climate Change

Council is working with Southland and Gore District Council and Environment Southland to establish the targets for greenhouse emissions and adaption to climate change, environmental sustainability and resilience. Community aspirations and abilities to deliver these outcomes may not align. Climate adaption through projects are currently managed on a project by project basis.

Seal Extensions and Dust

Seal extensions are an improvement area but due to funding criteria (e.g. FAR) and other budget pressures, no pervious allocations have been made available for extensions unless fully funded by Council.

Community Groups have signalled a desire to Council to have these included in the programme, Council has previously encouraged direct investment by local users.

Council will consult on the inclusion of seal extensions through the 2024 Long-term Plan, consultations process.

Council considered funding seal extensions to improve the level of service in regards to reduce dust impacts. It does however allow dust suppressants to be used where the suppressant is approved by Environment Southland. It should be noted that:

- Reliability of products is variable and is affected by weather
- No budget allocated to assist with direct costs of dust suppressants

Network Planning and Asset Management

Further investigation in network operational planning is considered to be needed for Invercargill to refocus on how the modal conflict (vulnerable users' vs freight) and demand can be better managed and aligned with opportunities within the State Highway network. Recent work on the Future Network Programme Plan may lead to future projects where additional bypasses or cycle facilities could be considered and implemented.

3.4.2 Level of Service Target Trends

Table 3.11 summarises proposed targets for the customer levels of service reported in this Plan.

Key Messages – Levels of Service

- Safety levels of service need a step change for improvement to be achieved.
- Value for money is largely being achieved.
- Improvements are needed in relation to active travel and climate emissions.
- Better or new measures are needed in some areas, such as heavy vehicles, contribution to the economy and multi-modal accessibility.
- The state of our roads is deteriorating (condition and STE) and the costs of maintenance once surface and pavement health falls below a certain threshold are set to grow exponentially. Significant investment in maintenance and renewals is needed now to maintain our existing network to an appropriate sustainable standard.

Table 3.11 Planned Customer Levels of Service

2018-2034 Level of Service	No	Type	Measure	Actual Trend	Target / Goal Trend	Measure 2018/19	Measure 2019/20	Measure 2020/21	Measure 2021/22	Measure 2022/23 Baseline	2024/2025 Target	2025/2026 Target	2026/2027 Target	2027-2034 Target
Health and Safe People	DIA 1 & ONF 1	Customer	The number of and change from the previous financial year in the number of fatalities and serious injury crashes on the local road network, expressed as a number	Increasing	Decreasing	6 more than previous year	2 less than 2018/19	13 - 4 less than 2019/20 (1 Fatality, 14 Serious Injuries	15 - 2 more than previous year (4 Fatalities, 18 Serious Injuries)	17 crashes - 1 fatality, 17 serious injuries	Lower than baseline	Lower than baseline	Lower than baseline	Zero
Health and Safe People	ICC1 & ONF 4	Customer	The number of crashes involving intersections	New Measure	Decreasing					101 crashes	Lower than baseline	Lower than previous year	Lower than previous year	Lower than previous year (zero fatalities, and decrease in serious injuries)
Inclusive Access	DIA 2 & ONF 6	Customer	The average quality of ride, on a sealed local road network, measured by smooth travel exposure	Decreasing	Increasing (Urban 84.5%, Rural 95.1%)	Urban - 89% Rural - 96%	Urban - 90% Rural - 98%	Urban - 90% Rural - 98%	Urban - 85% Ruiral - 98%	Urban - 83% Rural - 96%	> national average Changes Annual was: Urban – 82.6% Rural – 92.0% in 2022/23	> national average	> national average	> national average
Economic Prosperity	DIA 3	Customer	The percentage of the sealed local road network that is resurfaced	Not Applicable	> 5.5%	5.8%	6.1%	5.3%	5.5%	6.6%	>5.5%	>5.5%	>5.5%	>5.5%
Economic Prosperity	DIA 4	Customer	The percentage of footpaths within the district that fall within the level of service, or service standard for the condition of footpaths as set out in the Asset Management Plan	Increasing	< 8% in very poor condition	1.0%	0.8%	0.7%	0.5%	2%	< 8% in very poor condition	< 8% in very poor condition	< 8% in very poor condition	< 8% in very poor condition
Customer Service	DIA 5	Customer	The percentage of customer service requests relating to roads and footpaths, to which the territorial authority responds within the time frame specified in the Long-term Plan	Increasing	(80% of requests are responded to in five or less business days)	76%	80%	81%	78%	83%	75% of requests are responded to in five or less business days	75% of requests are responded to in five or less business days	75% of requests are responded to in five or less business days	75% of requests are responded to in five or less business days

Table 3.12 Planned Technical Levels of Service

Health and Safe People	ONF 2	Technical	Collective risk (crash density) – fatal and serious injury rate per km of road	Decreasing	Decreasing				Increased - no result yet, new measure	0.039	>2022/23	>2023/24	>2024/25	>2025/26
Health and Safe People	ONF 3	Technical	Personal risk – average annual fatal and serious injury crashes per 100 million vehicle-kilometres	Decreasing	Decreasing				Increased - no result yet, new measure	6.417	>2022/23	>2023/24	>2024/25	>2025/26
Health and Safe People	ONF 4	Technical	The number of deaths or serious injury crashes involving intersections	Increasing	Decreasing				New Measure	101	Lower than baseline	Lower than previous year	Lower than previous year	Lower than previous year (zero fatalities, and decrease in serious injuries)
Health and Safe People	ONF 5	Technical	The number of deaths or serious injury crashes involving vulnerable users	Increasing	Decreasing				New Measure	9	>2022/23	>2023/24	>2024/25	>2025/26
Inclusive Access	ONF 6	Technical	The average quality of ride, on a sealed local road network, measured by peak roughness	Increasing (target a decreasing trend)	Decreasing				New Measure	Urban - 117 Rural - 80	< national average Changes Annual was: Urban – 121 Rural – 96 in 2022/23	< national average	< national average	< national average
Economic Prosperity	ONF 7	Technical	Proportion of network not available to Class 1 heavy vehicles and 50MAX vehicles	Maintained or Increasing					Maintained	No decrease in % of network	Maintain / Increase proportion	Maintain / Increase proportion	Maintain / Increase proportion	Maintain / Increase proportion
Economic Prosperity	ONRC 8	Technical	The overall cost per km and Vkt of routine maintenance activities, and cost by work category on each road network for the financial year	Not Applicable	< Peer Group Average (66%)	Not achieved – this measure is very inconsistent across the peer group and does not give a meaningful result	67%	66%	80%	TBC	<= Peer Group Average	<= Peer Group Average	<= Peer Group Average	<= Peer Group Average

4. Demand for Our Services

4.1 DEMAND FORECAST

Council has developed a number of key assumptions for the Long Term Plan in setting strategic direction; these were listed in Section 2.9.

4.1.1 Factors Influencing Demand

This Asset Plan is based on a number of these assumptions which are seen to impact demand on Roading as follows:

Table 4.1 Factors Influencing Demand

Demand Driver	What's happening in the City	What does it mean for Transport?
Population	As at 30 June 2023, the estimated population of Invercargill is approximately 57,100. The population is projected to increase over the next ten years but growth will depend significantly on whether the Tiwai Point smelter closes or remains open, and whether or not various industries are developed as envisaged in the Beyond 2025 Regional Long Term Plan.	Sufficient network capability exists. Safety needs to be a priority.
Ageing Population	The assumption is those 65 years and older will make up over 24% of Invercargill's population by 2034.	Priority changes for access, safety and mobility needs. Fixed incomes will affect the ability to pay.
Technology	Changes in technology will affect how Council carries out its activities. Increased EV uptake	Changes in demand for services, parking and access will change. Increased requirement for EV charging stations
Customer Expectations	Increase in customer expectations of the services provided.	Unsealed road customers seeking methods to improve their service. More pressure on provided levels of service which are Waka Kotahi funded. Other funding sources may be needed.
Economic – Land Use	Changing land use is requiring different access to areas. Freight movements are changing and seeking different routes. School growth is occurring in some locations.	Use of the ONF and development of NOF routes to prioritise network use for particularly heavy vehicles. Parking and other mode access around schools needs to be reviewed and changed.

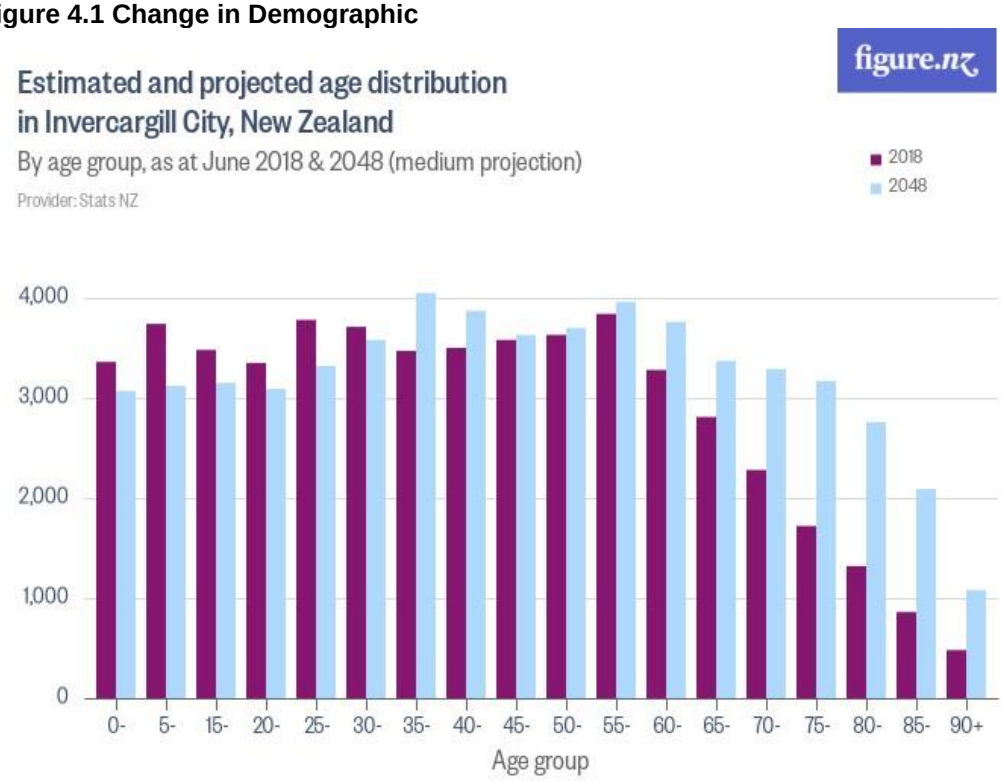
Environmental	Increasing awareness to carefully manage stormwater runoff and contaiminated material disposal. Growing longer term consideration for increased rainfall, sea level rise and impacts of natural disasters.	Disposal of stormwater and detritus more expensive and difficult. Potential treatment considerations. Inputs into future designs required. Consideration of the impacts of climate change and disaster events on the network.
Tourism and Visitor Numbers	Tourism in the Visit Southland area is expected to increase to between 160% - 165% of pre-Covid levels by 2029	Review of services provided.
Active Transport	There is a growing expectation that more travel will be by passenger transport, electronic mobility devices walking and cycling.	Greater need to promote and support activities which encourage active transport modes. Consideration of more connections to cycleways and investment where safety issues create unacceptable risk.

Population and Demographics

Following is the change in demographics expected through to 2048. The key differences between 2018 and 2083 relate to the reduction in population of those between under 30 years and increasingly higher growth rates with age above 35 years with a significant increase in those above 60 years.

This change will shape a number of service levels over the years as the customer base ages.

Figure 4.1 Change in Demographic



Technology

Technology change is occurring, with autonomous vehicles emerging in the market in varying levels of automation. Longer term impacts are likely to be that roads will be used in a different way. Within the term of the plan roads will continue to provide an access corridor for the community. Road condition will continue to be at similar service levels as new vehicles may have the ability to minimise the impact of road defects.

Road safety is expected to improve through the availability of better cars with more safety features. This will provide a higher level of service, however the community expectation will also grow accordingly as these features become more available.

A transition period where old cars are retired from the national fleet will potentially limit the maximum benefits. Electric Vehicle (EVs) use is also increasing, this will have an impact on increased demand for charging stations and consideration as to whether VKT reduction is an appropriate tool to measure for Climate Emissions.

The use of alternative modes of travel is likely to increase and the demands from e-scooters and mobility travel will seek to have better and more appropriate footpaths and / or separated shared paths. More electric charging stations are being provided mostly by the commercial sector. The ability to respond will be a key input into the potential shifts.

Economic and Land Use Trends

While the City's economy is relatively stable, the growth in population and demographic change leading to smaller household sizes will result in the development of new residential subdivisions and extension to the road network. New developments do however present the opportunity to improve local accessibility and safety.

There are no significant changes in rural or urban land-use within the City that could affect demand on the assets.

Changing land use also may place pressure for changes to levels of service for unsealed roads.

Heavy Vehicle Trends

Changing economic patterns within the wider Southland and Otago regions, particularly relating to agriculture, forestry and dairying, means more heavy vehicle use of connecting roads through the City, for example to the Port, Airport, and other significant industrial destinations within the City and region.

Changes to allow larger and heavier vehicles (HPMVs) on roads throughout the country will have longer term implications for pavement and bridge assets. These are starting to become more evident particularly on the State Highway network.

Environmental

Climate change, resilience and natural hazard risk and wider sustainability issues are addressed in Section 6. Further to the potential implications of such risks, increasing pressures to improve the quality of stormwater discharges from road surfaces, energy use and the use of bituminous products will all have an effect on how the assets are maintained in the future.

Tourism

Tourism was growing to be a significant industry within the wider Southland region, pre-Covid 19 post pandemic numbers are projected to increase to 160% above previous levels. Visitor numbers with local events such as the Burt Munro Challenge and Bluff Oyster and Food Festival, put an increased expectation for more facilities such as rest areas, campervan discharge points, as well as information signage. Increased self-drive tourism means more drivers using the road network who may be unfamiliar with local driving conditions or requirements. The use of mobile navigation platforms has increased.

4.1.2 Projected Growth or Decline in Demand for the Service

The roading activity is not expecting any significant growth in demand overall for capacity on the network. The change in demand with modal shift using the network is creating new conflict in spaces.

Invercargill has well-formed wide transport corridors and has been able to closely match the ONF classifications with the available roading network.

Cycle networks are being successfully integrated within the existing road space available and are again well integrated with on and off-road connections. However, cycle ways lack connectivity with State Highway roads which act as a barrier splitting the City in 4 quadrants.

Further investment to complete and connect cycleways is required.

Population demographic changes as outlined above suggest an increase in demand for mobility and access issues predominantly on footpaths. Users such as e-scooters will place more demand for use of the same space. The current network of footpaths

will remain appropriate although some widths may need to be upgraded and be incorporated in planned renewal works.

Customer demands from residents on unsealed roads continue to grow with the desire to have less dust and a better road surface. The demand has seen requests to Council for additional seal extensions to occur. Council will make a decision whether to commit funding through the LTP process. A draft Unsealed Road Seal Extension Policy is being considered (Appendix 4)

Visitors to the City will seek more parking spaces. Development in the CDB has provided a large number of mall carparks. This will change the demand patterns. New parking technology with price based demand management techniques have also been implemented, this area will be monitored to see if these solutions have satisfied the demand.

Traffic growth is seen to continue to follow a low growth projection, it is a strategic objective to reduce traffic VKT, and we are working to promote active transport, but even with this we expect that the uptake in hybrids / EVs and post COVID travel will see low growth on the network. Changes in autonomy of vehicles and ownership status are likely to have impacts at the later end of the plan but the impacts are unlikely to be rapid and some planned change can be managed. If long term infrastructure is planned (i.e. bridges with a 100 year life) then demand needs to be considered.

It is expected that demand patterns, much reflective of the population will be consistent with some small context growth.

4.2 CHANGES IN SERVICE EXPECTATIONS (FUTURE LEVELS OF SERVICE)

It is expected that future customer expectations may include:

- Provision of a gathering space for the city
- Provision of CCTV for urban and sub-urban centers.
- Flow between the west and south of the city, including new commercial developments
- Safer travel
- Greater resilience of roads to storms
- Climate adaption
- Modal shift to integrated and active travel options where Passenger Transport, Uber (on demand travel) e-scooter or micro mobility are considered accessible for use
- Better environmental controls on Unsealed Roads, in particular dust management
- Smoother travel in vehicles
- Linking communication driven travel options, including coordinated controls such as traffic signals
- A more accessible community
- More effective network for freight vehicles
- Meeting the needs of all the city's residents and supporting new development
- Greater environmental awareness and consideration
- Traffic congestion at Stirling Point, Bluff
- Enhanced sub-urban infrastructure
- Greater demand for charging stations

4.3 EXPECTED IMPLICATIONS FOR THE ACTIVITY

In summary the overall impact of these changes on the Transport Outcomes Framework is expected to either be worse, neutral, or improve over time:

Table 4.2 Expected Implications for the Activity

Demand Factor	Health and Safety	Resilience and Security	Economic Prosperity	Environmental Sustainability	Inclusive Access
Population and Demographics	WORSEN Larger numbers of older drivers and road users may increase safety risk	NEUTRAL There is little if any direct effect on existing assets	WORSEN Aging population will impact ability to pay moving into the future	NEUTRAL There is little additional impact from population change	WORSEN Increased demand for non-car modes – walking, mobility scooters, bus use
Technology	IMPROVE Safer vehicles should reduce crash risk	NEUTRAL Potentially could improve asset data quality leading to better AM	IMPROVE Better technology should improve the efficiency of use and effectiveness of decision-making for the network.	IMPROVE Improved vehicles will assist the environment through lower emission, e.g. electric. New cars have better performance	IMPROVE Better communications technology should improve how the network is used
Economic and Land-use Change	NEUTRAL Growth in network use probably offset by local safety improvements	WORSEN More demand on existing assets	NEUTRAL Grid network has capacity to allow for economic opportunities.	WORSEN More demand and more heavy vehicles will impact the environment. More travel will have negative effects.	NEUTRAL Growth in network use probably offset by local accessibility improvements
Heavy Vehicles	WORSEN Greater potential for conflicts between vulnerable road users and HVs	WORSEN Increased pavement deterioration	IMPROVE Allow for more economic opportunity.	WORSEN More demand and more heavy vehicles will impact the environment	WORSEN Current problems will escalate with growth of HVs
Environmental (Storm Events)	NEUTRAL Unlikely to be an issue – unless drainage LoS reduces with more surface stormwater on the road	WORSEN Increased risk to community need to maintain and improve current drainage provision	WORSEN Cost impact of storm events increasing demand on available budgets.	WORSEN More pressure for improved treatment of stormwater runoff from roads	NEUTRAL More storm events will create issues and costs for ensuring travel options are available

Demand Factor	Health and Safety	Resilience and Security	Economic Prosperity	Environmental Sustainability	Inclusive Access
Environment – Climate change and hazards	WORSEN Increased hazards for road users	WORSEN Increased damage to assets from events	WORSEN Cost of adaption and mitigation.	WORSEN More damage to the natural environment	WORSEN More disruption due to storms and coastal impacts
Tourism	WORSEN More drivers unfamiliar with local conditions, increased crash risk	NEUTRAL Unlikely to be any issues	IMPROVE Increased road user charges.	WORSEN When growth occurs this will have a negative impact	WORSEN Could increase demand for particular facilities
Active Transport	IMPROVE Walking and cycling in greater numbers will assist with safety as users become the norm	NEUTRAL Existing facilities have reasonable capacity to allow increased numbers	IMPROVE Active Transport options will improve economic options for transport.	IMPROVE Walking and Cycling are good for environmental changes	IMPROVE Increased demand will ensure facilities are sought and strengthened for the sector.

As technology develops with less dependence on the driver, the journey will need to be more enjoyable and coordinated as the driver has to do less. This could mean that the surfacing of roads will need to be smoother and delays through roadworks minimised.

There will be a need to coordinate traffic equipment with on-board car technology to deliver safe travel and time reliability, identify and pay for parking and provide the best journey.

The total number of cars may decrease.

Controls for streetlights will likely be coordinated to maximise safety and be either dormant or dimmed when not needed for pedestrians or cars, thereby saving power and costs and pressures on the environment.

Heavier vehicles, linked by technology, are likely to create pressures on pavements as the freight load increases.

Road dimensions and maintenance demands may change as better optimisation of lane usage is achieved by technology.

Where people live and where they want to travel to and by which means will change the activity. If less air travel is considered desirable, then road travel may increase.

Responses to these implications are described in Section 4.4.

4.4 FUTURE DEMAND ISSUES AND CHALLENGES

Future demand is not expected to place significant extra traffic volumes on the network as the population profile is relatively static.

The road space will still need to be used for access and it may be that cars look different, but the space will still be required. Traffic congestion in Invercargill is not likely.

However, increased heavy traffic loads will need to be managed, including the growing use of HPMVs which will need to be focused on the appropriate ONF road hierarchy where pavements are strengthened and surfacing maintained to cope with them. This could include the need for restrictions on HPMV vehicles, particularly for load restricted bridges but potentially also on roads with lower strength pavements.

Car technology is evolving rapidly with autonomous vehicles, including many safety features such as lane divergence sensing and other changes being developed and likely to be delivered during the full scope of the Plan. This technology may change how roads are managed, operated and funded.

The need for accessibility will grow and choices people make to travel are likely to be different as greater environmental and resilience issues become stronger in the community. A changing acceptance and less reliance on cars is occurring which will lead to micro mobility options being utilised.

A challenge to manage in rural areas will be the dust issue from unsealed roads and how the health aspects are understood by customers. A draft policy is included in the appendices to assist with prioritising options and funding options are being assessed by Council through the LTP.

Environmental and resilience issues with increased stormwater runoff from roads are likely to be a more important aspect to manage in the future. The options to better manage the more frequent storm events is required.

The implications of climate change and natural hazards need to be better understood in terms of where in the network such impacts might occur, together with their severity and the identification of potential mitigation options and risk management strategies.

The need to identify and utilise non-bitumen based surfacing products will be required from economic and environmental need.

4.4.1 Possible Asset-related Demand Responses

The first set of options for demand response is to create new or different assets or modify the approach to the maintenance or renewal of existing assets.

Given the low level of growth expected, coupled with the nature of the City's expansive road network, no significant investments in new roads or additional capacity are envisaged.

However, in order to address the safety, environment, and accessibility problem statements, investment in some new assets (or improvements) is likely to be required.

Council will need to encourage the use of newer and safer cars which use less fossil fuel energy.

Asset maintenance and renewal activities will need to be reviewed to meet agreed standards and will also need to take demand factors into account when programming and carrying out work (for example, the physical needs of mobility scooters at road crossings). An increase in pavement resurfacing and rehabilitation, as shown by the asset modelling, highlights further investment is needed just to keep the existing assets at the required level of service.

Long term assets such as pavements, kerbing and bridges will need to be carefully considered and whole of life approaches taken. The Council bridge stock held is relatively young but some replacements will be required.

The future of vehicles (EVs and mode shift, in particular) will change a number of national approaches to congestion and safety but the impacts of these technological advances are starting to require changes lane allocation but not in road layout or construction. As congestion is not an issue, autonomous travel will not deliver short term benefits.

Autonomous car technology will require protocols in relation to how roads are configured, marked and delineated. The Plan does not specifically make significant adjustments for changing technology whilst it is acknowledged they will occur. National and international guidance will be required and standardisation sought.

New technology will provide much greater opportunity to understand the loads being applied to pavements, including where and how they respond; the use of this technology will enable better long term understanding of demands on the pavement.

Council is considering the pursuit of potential seal extension programme to address customer demand and will monitor national developments. ICC has developed a draft policy to look to assist with decision making and is aligned to the Waka Kotahi General Circular Investment: No 16/04. Seal extensions may however be undertaken in association with lifestyle subdivisions.

Possible stormwater containment or treatment in conjunction with Council drainage plans may be needed to improve the quality of discharges to the environment. Changes to sump designs and maintenance frequencies are likely. Better controls and management will be needed.

4.4.2 Non-Asset Solutions

The second set of options relates to actions which change the way assets are used.

Usually labelled “demand management”, activities such as encouraging less car journeys or modal shift will be appropriate in reducing the need for investment in roads.

The community is seeking to have more access to active mode options including PT (and / or on demand services). These will be key elements in delivering any solutions.

Many of the responses to future demand are likely to be non-asset solutions. Some will be in vehicles as they are manufactured. Others will be educational and behaviour changes including a shift to active transport modes such as walking or cycling to work and school.

This shift in transport demand, whilst not in assets will require appropriate investment in suitable training and education resources and programmes to complement asset solutions, such as delineation.

Many of the problem statements on safety will look to non-asset solutions.

4.4.3 Managing Expectations

A third option for responding to demand is to influence customer expectations, effectively reducing the demand. These may include:

- Engagement and communication programmes to reduce the level of community expectation for smooth roads.
- Long term asset investment is required to keep assets operating at the standard required and this investment does vary over time.
- Change planning rules and communication (at resource consenting) to reduce the expectation of rural lifestyle residents for the same level of amenity as provided on residential streets.
- Making sure drivers understand active transport and how this interlinks into the demand approach and accept that part of the road corridor is allocated for their use.
- Ensuring Passenger Transport and Total Mobility are accepted as key options for travel and they continue to be supported by the community. Travel for those who are unable or cannot afford cars is key to ensuing access for everyone in the community to business, school or community life.
- Gaining awareness of and acceptance that dust on low volume unsealed roads will remain and that Council does not plan to invest in this improvement.

4.4.4 Key Messages – Demand

Key Messages

- Council has a desire to invest in urban and sub-urban infrastructure, enhancing 'place' within the community.
- Growth is not an issue in relation to road capacity, increased residential development could have impacts on rural to peri-urban level of service improvements (Ōtatara)
- Increasing customer expectations will continue.
- Need to examine freight movements and corridors.
- More investment to meet growth in active transport and other modes is anticipated.
- Rising stormwater quality expectations.
- Climate change and natural hazards are becoming more pressing
- Council is considered investment in seal extensions to meet customer demands as per the draft policy but deemed this to be unaffordable to the community at this time.
- Modal shift and the required changes to lane allocation to safely allow for this.

5. Asset Profile

5.1 ASSET OVERVIEW

The roading activity provides a safe, effective and efficient transport system in the City and contributes to the wellbeing of the community.

The transport network and roading infrastructure comprises road pavements and surfacings, street lights, traffic signs and signals, footpaths, drainage, surface water channel systems, bridges, culverts, street furniture, parking facilities, public transport infrastructure, vehicle access crossings and cycle tracks. Council also delivers the passenger transport and total mobility activities for Southland (also refer to RPTP).

When all the assets work together they provide integrated access to the community in a safe and effective way.

The plan considers the assets together and describes them and the way we manage them through grouping them into the following areas:

- Sealed Road Pavements
- Unsealed Pavements
- Kerb and Channel, and Drainage
- Footpaths
- Traffic Services
- Structures
- Carparking
- Other Assets
- Public Transport Assets

5.2 ASSET DESCRIPTION

This section provides an overview of asset information for these asset groups.

Council uses the Roading Assessment and Maintenance Management (RAMM) asset management software to record information about roading assets.

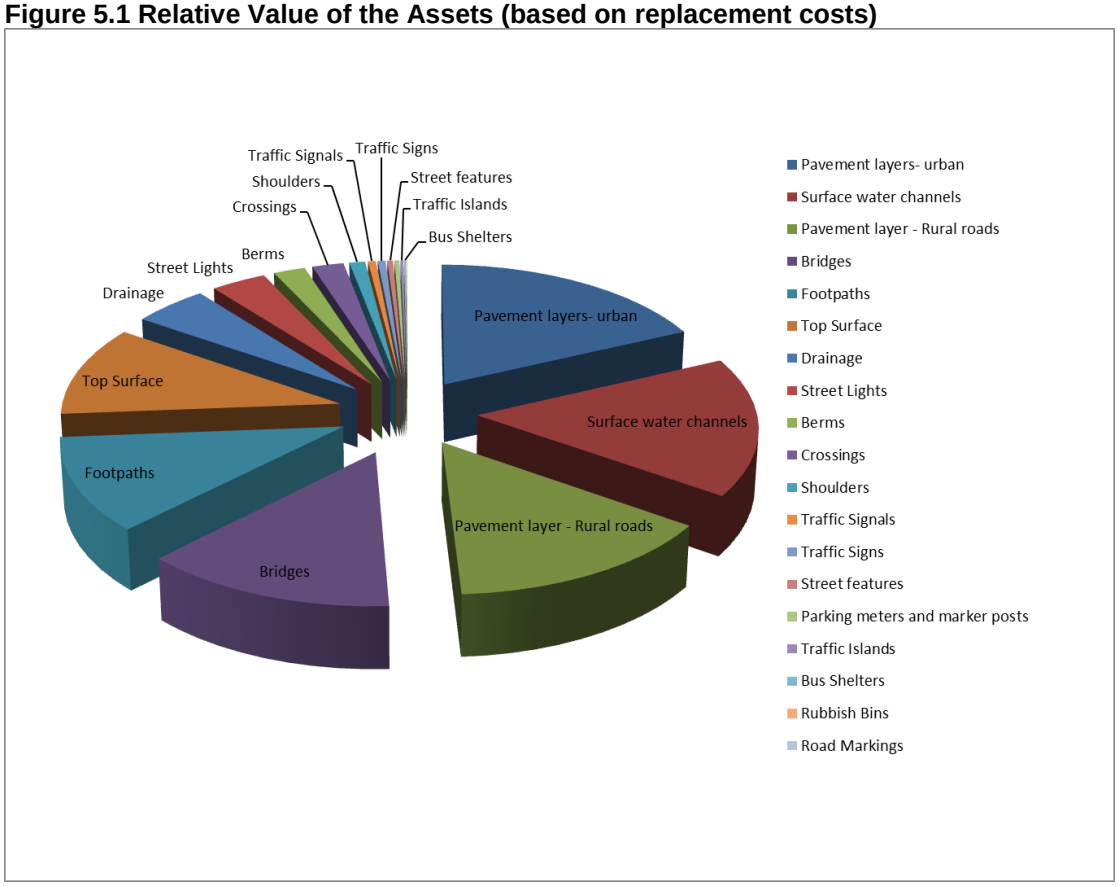
A high-level summary of the assets is shown in the following table – valuation information relates to the asset valuation as at 30 June 2022.

Table 5.1 Asset Description

Asset Group	Replacement Cost	Depreciated Replacement Cost	Annual Depreciation	Quantity
Topsoil removal - Rural	$691,243.37	$691,243.37	$0.00	345756 m3
Topsoil removal - Urban	$1,053,621.89	$1,053,621.89	$0.00	562729 m3
Excavation layer - Rural	$9,065,148.26	$9,065,148.26	$0.00	723137 m3
Excavation layer - Urban	$14,681,188.84	$14,681,188.84	$0.00	1081629 m3
Total Road Formation	$25,491,202.36	$25,491,202.36	$0.00	
Pavement layer- Urban	$100,743,893.29	$29,126,072.23	$1,237,915.89	994656 m3
Pavement layer - Rural	$72,144,901.05	$25,148,188.65	$839,017.94	556671 m3
Total Pavement layers	$172,888,794.34	$54,274,260.88	$2,076,933.83	
Top Surface	$62,547,123.84	$12,303,389.86	$3,124,142.39	861315 m2
Shoulders	$6,142,809.84	$2,006,727.35	$80,777.70	476636 m2
Berms	$12,113,597.00	$12,113,597.00	$0.00	135295 m2
Total Roadway assets	$80,803,530.68	$26,423,714.21	$3,204,920.09	
Sign	$1,604,156.31	$414,334.52	$93,549.49	9947 Nos
Sign Post	$928,312.46	$301,019.92	$43,089.41	6116 Nos
Traffic Signs	$2,532,468.77	$715,354.44	$136,638.90	
Street lights and lamp	$6,156,403.67	$4,460,511.55	$303,780.76	7155 Nos
Street light poles	$15,796,585.18	$10,005,610.61	$315,174.04	4510 Nos
Street light brackets	$3,236,201.36	$1,445,571.87	$64,666.68	6967 Nos
Street Lights	$25,189,190.21	$15,911,694.03	$683,621.48	
Sub Total	$306,905,186.36	$122,816,225.92	$6,102,114.30	
Other Assets				
Bridges	$87,099,177.12	$43,154,034.43	$881,175.59	12882 m2
Bus Shelters	$697,424.23	$366,492.30	$17,022.11	57 Nos
Crossings	$17,522,066.03	$4,813,699.69	$469,333.60	20126 Nos
Drainage	$29,813,963.18	$11,045,480.65	$357,850.99	Refer S3.11
Street features	$1,958,450.38	$610,812.71	$73,055.96	148 Nos
Footpaths	$92,323,839.10	$38,471,708	$2,260,882	890529m2
Surface water channels	$135,170,382.16	$46,385,385.32	$1,719,590.48	776844 m
Rubbish Bins	$267,622.94	$16,947.25	$13,124.15	128 Nos
Road Markings	$92,828.00	$14,248.40	$14,248.40	4036 Nos
Traffic Islands	$1,121,208.00	$729,828.00	$37,374.60	115 Nos
Other Assets Total	$366,066,961.14	$145,608,636.75	$5,843,657.88	
Minor Structures				
Riprap Tiwai causeway	$6,152,317.00	$2,953,112.16	$61,523.17	1 Nos
Core - Tiwai causeway	$5,335,066.00	$5,335,066.00	$0.00	1 Nos
Bridge approaching ram	$1,774,328.25	$958,137.26	$17,743.28	1 Nos
Minor Structures Total	$13,261,711.25	$9,246,315.42	$79,266.45	
Traffic Facility				
Parking meters	$742,559.18	$618,084.19	$71,320.03	92 Nos
Edge marker posts	$152,173.14	$15,920.79	$8,146.91	5667 Nos
Traffic Facilities Total	$894,732.32	$634,004.98	$79,466.94	
Traffic Signals				
Attachment	$73,381.74	$35,300.48	$2,935.27	190 Nos
Target board	$76,821.51	$25,394.36	$3,841.08	194 Nos
Cables	$480,688.00	$135,803.82	$19,227.52	127 Nos
Controller	$826,656.84	$278,906.83	$33,066.27	23 Nos
Lantern	$1,179,460.90	$726,127.02	$47,178.44	406 Nos
Traffic Loops	$237,545.93	$35,631.89	$11,877.30	119 Nos
Ped call box	$159,813.38	$52,544.80	$6,392.54	144 Nos
Signal poles	$624,323.97	$274,970.80	$24,972.96	178 Nos
Traffic Signals Total	$3,658,692.27	$1,564,680.00	$149,491.38	
Sub Total	$383,882,096.98	$157,053,637.15	$6,151,882.65	
Grand Total	$690,787,283.34	$279,869,863.07	$12,253,996.95	

The replacement value of our roading assets is $690 million, excluding parking buildings and land for off-street parks. These assets are depreciating at the rate of $12.25 million per annum.

Figure 5.1 Relative Value of the Assets (based on replacement costs)



This graph excludes the cost of road formation which accounts for around 10% of the total value of pavement assets. Formation is not depreciated or managed as a separate asset (such as land) and is therefore not included on the graph.

Major parts of the valuation are pavement layers 28%, surfacing 10%, kerb and channel 13%, footpaths 10% and bridges 12%. These account for 73% of the value.

5.2.1 Network Characteristics

Invercargill has a relatively small network length and has a split of approximately 50% urban. Te Ringa Maimoa (formally REG) has developed peer groups of similar networks according to the percentage of urban roads in a network. This is being utilised to highlight how networks are being managed.

Invercargill City is within the “Cities with between 50% and 90% Urban” groups and has other comparative cities including Napier City, Porirua City, Nelson City, Christchurch City, Upper Hutt City, Palmerston North City, Kapiti Coast District and Auckland Transport.

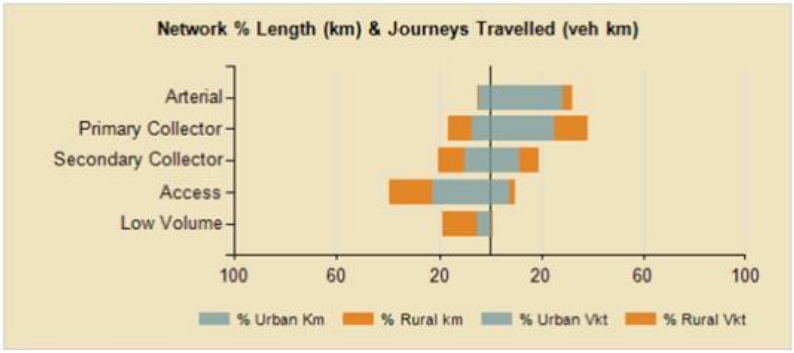
These peer groups provide one view of cost and network related factors that should be considered when comparing cost and levels of service achieved.

The following table is an extract from the ONRC* Performance tool and demonstrates the network characteristics and annual numbers of journeys across the hierarchy:

Table 5.2 Network Statistics for Network Length (KM) and Journeys Travelled
Sourced from Te Ringa Maimoa - Performance Measures Reporting Tool (PMRT)

ONRC	Urban (km)	Rural (km)	Total Length (km)	Lane (km)	Urban Journeys (MVKT)	Rural Journeys (M VKT)	Annual Total Journeys Travelled (M VKT)	Percentage of Length
Arterial	28	3	31	65	75.7	9.3	85.1	5%
Primary Collector	43	58	100	194	67.2	33.6	100.8	17%
Secondary Collector	59	62	121	238	30.4	20.6	51.0	20%
Access	135	98	233	429	20.0	5.4	25.4	39%
Low Volume	31	81	112	158	1.3	1.0	2.3	19%
TOTAL NETWORK	295	302	597	1,085	194.6	70.0	264.6	

Figure 5.2 Network % Length (km) & Journeys Travelled - vehicle km travelled (Vkt)
(sourced from Te Ringa Maimoa - PMRT)



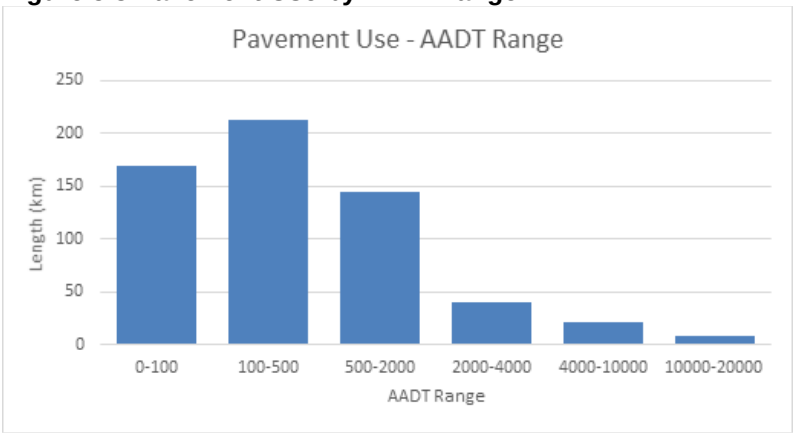
*ONRC is a more appropriate measure than ONF as these are seen as corridors where as in ONF one corridor can have multiple categories.

The above figure shows visually that most of the urban vehicle kilometres travelled are on Arterial and Primary Collectors. Primary collector routes make up only 17% of the network by length but carry 38% of the amount of travel undertaken in the City due to the higher traffic volumes.

This would be expected in a hierarchy where such roads are designed, built and maintained to cater for higher volumes of traffic. This also suggests that the classification of the network (into the different classes) is appropriate.

Over 88% of the network length has traffic volume less than 2,000 vehicles per day; and just 1.4% of the network carries more than 10,000 vehicles per day.

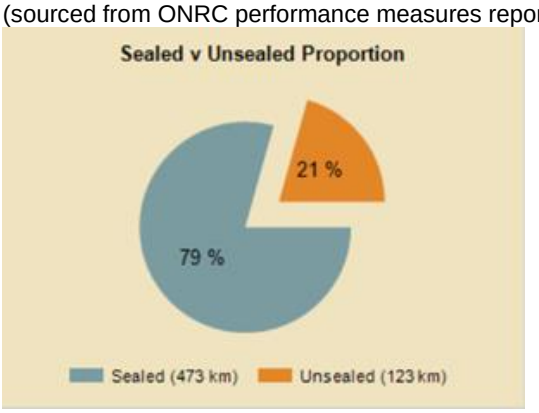
Figure 5.3 Pavement Use by AADT range



Also noted is the sealed – unsealed split by proportion. The network is primarily a sealed network as shown below. All of the unsealed roads are rural.

The Pavements section of the asset description includes Pavement Layers and Surfacings. The assets of Land and Formation, although making up a significant asset, are not considered to be consumed or depreciated and consequently are not considered further in the asset description.

Figure 5.4 Sealed v Unsealed Proportion
(sourced from ONRC performance measures reporting tool)

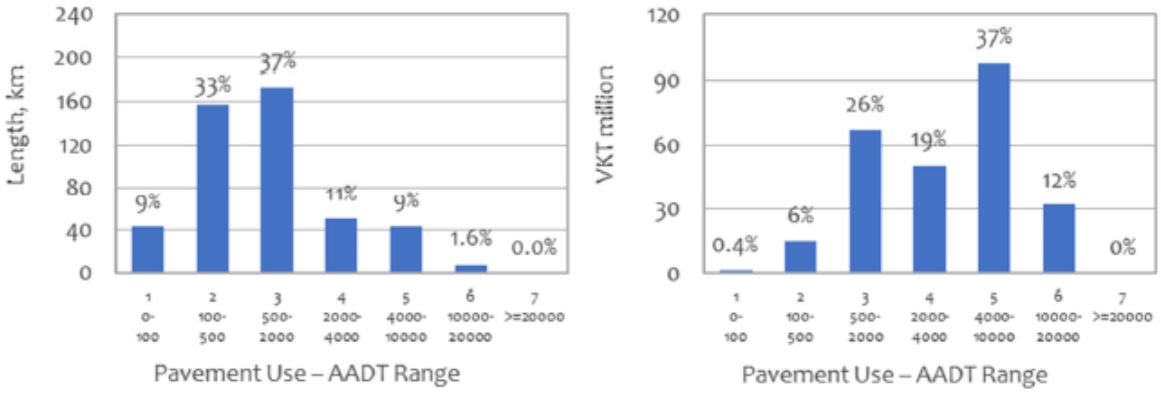


5.2.2 Traffic Volumes

Figure 5.5 illustrates the distribution of traffic, expressed as Vehicle Kilometres Travelled (VKT) based on the RAMM Pavement Use ranges. VKT is a function of the length of a treatment length and the associated AADT. VKT shows how many vehicle 'miles' are travelled on the networks.

Figure 5.5 indicates almost 70% of all travel is on roads with Pavement Use 4 or greater (more than 2,000 AADT), despite these roads having just a 21% of the share of network length. Almost 50% of all travel is on roads with Pavement Use 5 or greater (more than 4,000 AADT), despite these roads having just 11% of the share of network length.

Figure 5.5 Traffic Volumes (AADT and VKT on Network)



5.2.3 Asset Lives

Table 5.3 lists the useful lives of the main asset types on the network, where there is greatest financial value.

Table 5.3 Asset Type and Useful Life

Asset Area	Type of Material	Useful Life (Years)
Surfacing	Asphaltic concrete	20
	Interlocking Block	20
	Metal Running Course	5
	Slurry Seal	6
	Two Coat Chip Seal – Urban and Rural	16
	Single Coat Chip Seal – Urban and Rural	13
	Cape Seal	15
Pavement layers	Basecourse – Urban and Rural	80
	Sub-base – Urban	80
	Sub-base – Rural	Indefinite
Bridges	Timber	70
	Concrete including Culverts	100
Footpaths	Asphaltic Concrete and Seal	30
	Concrete (75mm thick)	50
	Concrete (100mm thick)	70
	Interlocking Block	40
	Metal	10
Surface Water Channels	Kerb and Channel (concrete) – Access Road	85
	Kerb and Channel (concrete) – Primary / Secondary Collector Road	75
	Kerb and Channel (concrete) – Arterial Road	60

Also attached in Appendix 5 is a full listing of asset lives.

Key Messages – Roading Network Statistics

- Invercargill is a relatively small network.
- Evenly split between urban and rural roads, with a total length of 597 km.
- Sealed roads make up 79% of total network length.
- Traffic distribution aligns to ONRC classification (ONF not used here).
- Network relatively lightly trafficked at 264 M VKT.
- Roading assets are valued at $690 million (2022), with a depreciated replacement cost of $280 million.
- Other key asset groups include 55 bridges, 784 km of kerbs and channels, and surface water channels, over 7000 street lights, and 500 km of footpaths.
- Pavements Value is about 28%, Surfacing 10%, Footpaths 10% and Bridges 13%.

5.2.2 Sealed Pavements

Sealed Surfaces

Surfacing is the top and "visual" layer of the road, its purpose is to waterproof the road and provide (in some cases) a smoother travel experience.

All road surfaces have a replacement cost value of $62.7 million and an annual depreciation of $3.1 million, most of this relating to sealed surfaces.

The lengths of sealed surfaces by ONRC classification are as follows:

Table 5.4 Lengths of Sealed Surfaces by ONRC Classification

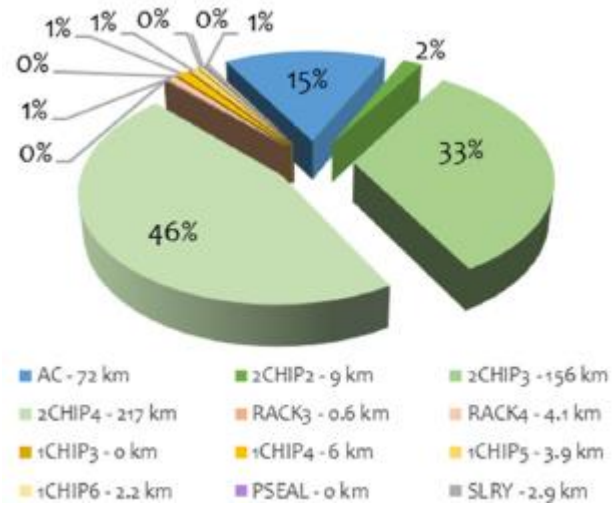
ONRC	Urban (km)	Rural (km)	Total (km)	% of Sealed Network
Arterial	28	3	31	7%
Primary Collector	41	58	98	21%
Secondary Collector	58	62	120	26%
Access	134	50	184	40%
Low Volume	29	3	31	7%
Totals	**289**	**175**	**464**	100%

Surfacings

The following table shows Top Surface asset details, and as this asset is approaching two full lifecycles it is considered to be reliable and accurate information.

Table 5.5 Table of Sealed Roads Top Surface Materials

Material	Urban Km	Rural Km	% of Network
Asphaltic Concrete	68.5	1.8	15.1
Two Coat Seal	207.4	166.7	80.6
Single Coat Seal	3.5	5.2	1.9
Racked in Seal	2.4	2.3	1.0
Void Fill Seal	1.0	1.6	0.6
Cape Seal	2.3	0.0	0.5
Bitumen Bound Macadam	0.7	0.0	0.1
Slurry Seal	0.6	0.0	0.1



The majority of surfacing in Invercargill is two coat chip seal (80.6%). Asphaltic concrete (15.1%) is utilised predominantly on ONRC hierarchy Arterial and Primary Collector roads, as well as in high stress areas such as cul de sacs or where there are significant vehicle turning movements. Twin cost emulsion seals have been utilised for many years successfully.

Sealed Surface – Remaining Surface Life

The following diagrams show remaining surface life (RSL) data for the two predominant types of surfacing. The blue bars show a positive expectancy, while the red bars show surfaces that are past their expected useful lives.

Figure 5.6 RSL - Chip seals 2019

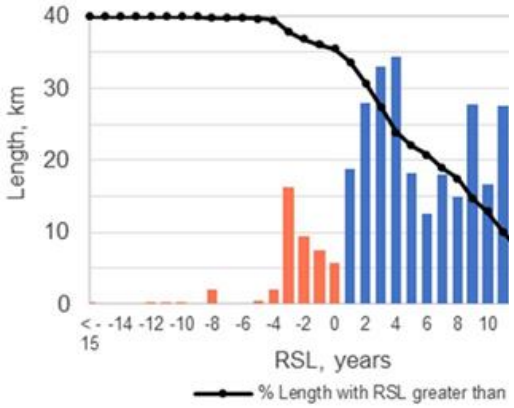


Figure 5.7 RSL - Chip seals 2023

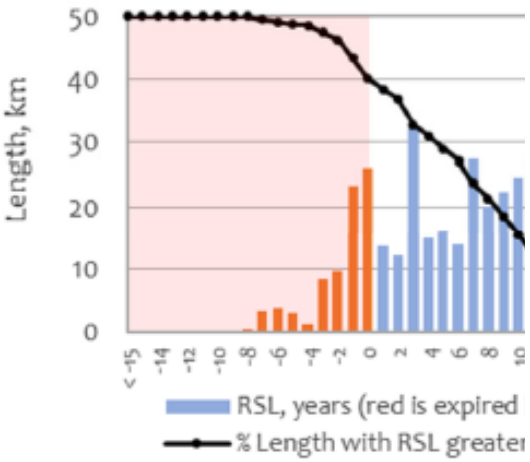


Figure 5.8 RSL Asphaltic Concrete 2019

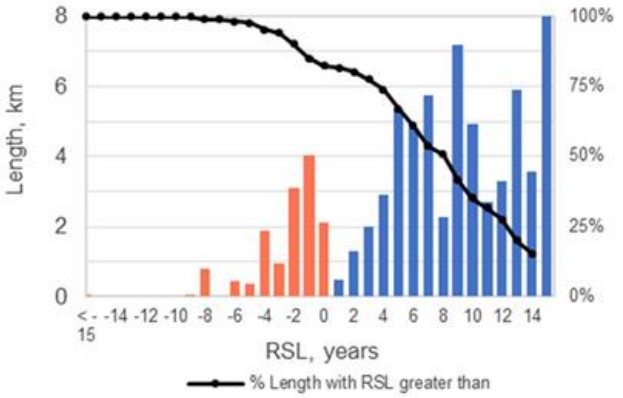
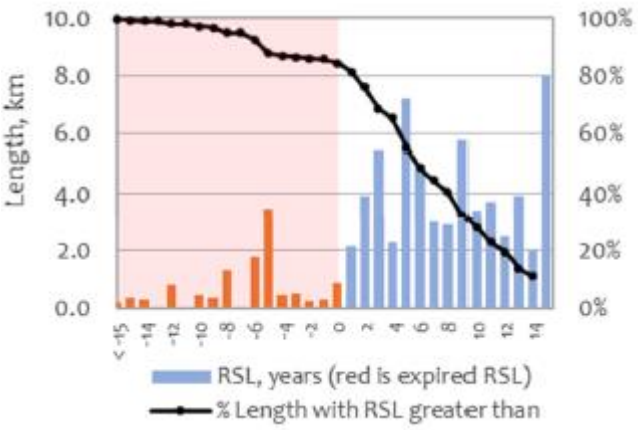


Figure 5.9 RSL Asphaltic Concrete 2023



The spread of remaining surface life shown here is a much more useful measure than the age of the surface as it gives an indication of the work that is about to be required. It is acceptable for there to be negative lives as some surfaces last longer than the predicted life.

The graphs indicate a trend that resurfacing budgets have not been sufficiently allocated to support both chipseal and AC resurfacing in the future programmes need to ensure that these surfaces are adequately funded and managed.

Pavement Layers

Pavement layers are the “gravel” base strength of the road upon which the surfacing is laid.

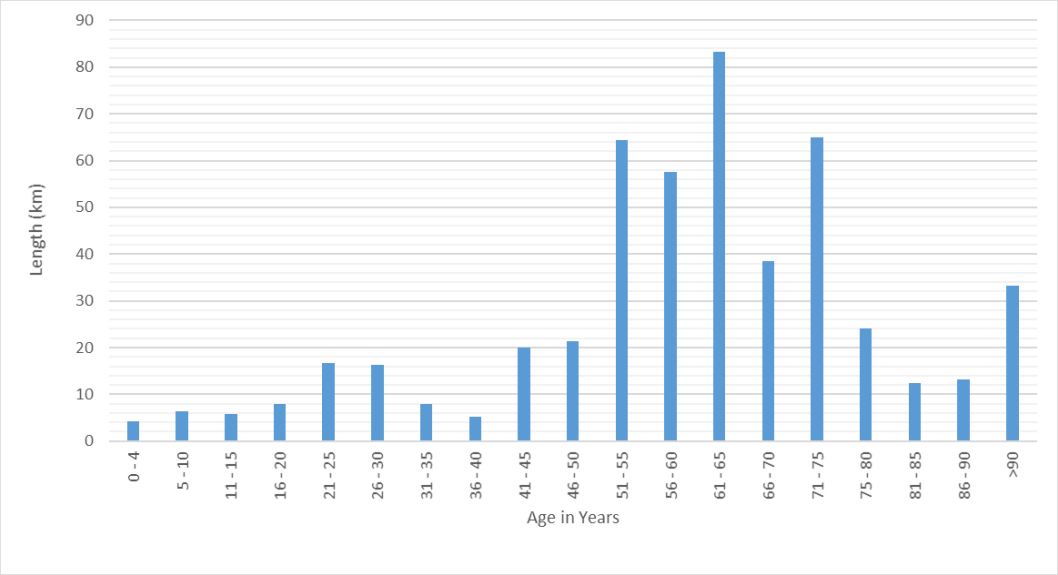
Pavement data is also stored in RAMM and is reliant on the accuracy of historical data input. In most cases this has proven to be reliable, however some historical information has been estimated.

Council has an experienced team of staff and with this knowledge complements RAMM to assist with understanding the available source information.

Pavement layers both sealed and unsealed have a replacement cost value of $179 million (including shoulders) and an annual depreciation of $2.16 million.

Actual and estimated pavement ages are shown below.

Figure 5.8 Pavement Ages



The network’s average pavement age is 60 years and 80% of the pavements have an age older than 45 years.

Based on RAMM data, over the past five years the average annual (renewal) achievement was 4.5 km (0.8%) and then extending this rate over the whole asset base equating to an approximate 125-year renewal return period for all pavements.

This rate of renewal would indicate not enough renewal is being undertaken as it is unlikely the network will last 125 years.

Key Messages – Sealed Pavements

- Pavement surfaces are mostly chip seal (>80%) and asphaltic concrete (15%).
- There is a modest amount of top surfaces which have a negative remaining life.
- Around 80% of pavement layers are older than 45 years (cf expected life of 80 years for all layers) except rural sub-base which is indefinite.
- Pavement layer remain lives are 50% consumed.

- Current pavement renewal equates to a 125-year return period and needs careful management and analysis.

5.2.3 Unsealed Pavements

Unsealed pavements are an important link in the usability of the network, providing vital connections for users to rural areas. Unsealed roads, although not long compared to other authorities, are a key part of the total network. They provide critical connecting access to the community.

A large portion of the unsealed network services areas populated by peri-urban developments. Some residents in these areas seek to have road surfaces of a higher standard and want conditions closer to a sealed environment to limit factors such as dust and wear on vehicles.

Unsealed road lengths by ONRC hierarchy are shown below:

Table 5.7 Unsealed Road Lengths by ONRC Hierarchy

ONRC Hierarchy	Length (km)	% Total Network
Access	48	8.0%
Access Low Volume	75	12.5%
TOTAL	**123**	**20.5%**

.

Unsealed pavements have been performing well and are a relatively low budget and asset value.

Council will considered through the Long Term Planning process if community demand to seal some portions of the unsealed network and an increased the level of service is to be invested to seal portions of the network. This is seen as unaffordable at this time and will be reviewed coming into the next long term plan.

Key Messages – Unsealed Pavements

- Unsealed roads play an important role in the total network.
- There are around 123 km of unsealed roads.
- Peri-urban developments are increasing expectations for seal extensions / improved service quality, this is currently seen as unaffordable.

5.2.4 Kerb and Channel / Surface Water Channels / Drainage Culverts

The Council manages:

- 544 km of concrete kerbs and channels, and 220 km of water tables, with a replacement value of $135 million.
  - Condition data is not sufficiently detailed to model accurately but by valuation it is 65% consumed with annual depreciation of $1.7 million. This suggests a long-term average renewal rate of a similar amount.
  - These include kerb and channel, kerb only, mountable kerbs and water tables.
- Drainage assets which include sumps and over 700 culverts with a replacement value of $29.8 million and annual depreciation of $357,850.
  - Drainage culverts have a waterway area of less than 3.4m^2. Larger culverts are categorised as Bridges under Waka Kotahi funding requirements.

The following figures show details of kerb and channel, and earthen surface water channels.

No construction dates were historically available for recording in the database and so in 2002 construction dates were estimated using adjacent pavement construction dates. This is an area where more improvement is needed to give greater confidence in the data.

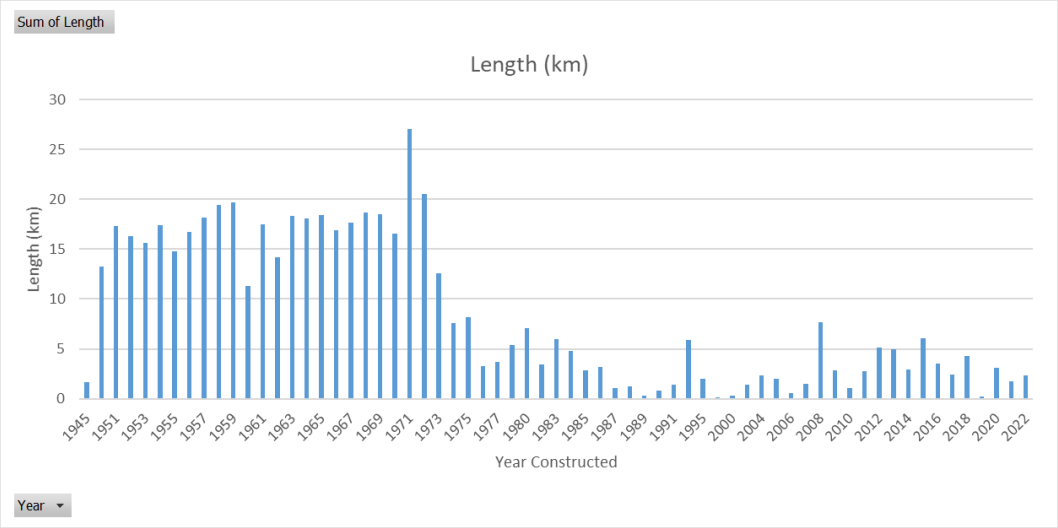
Reconstruction data is now entered into RAMM with actual construction dates.
Kerbs and Channels, and Surface Water Channels

Table 5.8 Channels

Item	Length (km)
Concrete Channel	
Kerb and Channel (concrete)	499.8
Mountable Kerb and Channels	6.7
Kerb only	29.0
Dished Channel	8.8
Earthen Surface Water Channels	
SWC (Deep, >200 Below Seal Edge)	138.6
SWC (Shallow, <200 Below Seal Edge)	81.4

The age profile of kerbs and channels by installation date is shown below:

Figure 5.9 Age Profile of Kerbs and Channels by Installation Date



The graph shows that there have been two strong construction periods in the 1950s and late 1960s. Whilst the installation date does not necessarily suggest a definite future renewal date, it does highlight the potential issue for renewals peaks when these assets are replaced and the additional investment that may be needed unless the peaks are smoothed or the lives extended.

Key Messages – Channels

- Concrete kerbs and channels in urban areas were largely built in the 1950s and 1960s, suggesting potential renewals peaks around the 2030s and 2040s assuming an average 80-year life.
- This group includes around 220 km of rural water tables.
- Overall, the asset group is valued at $165 million.

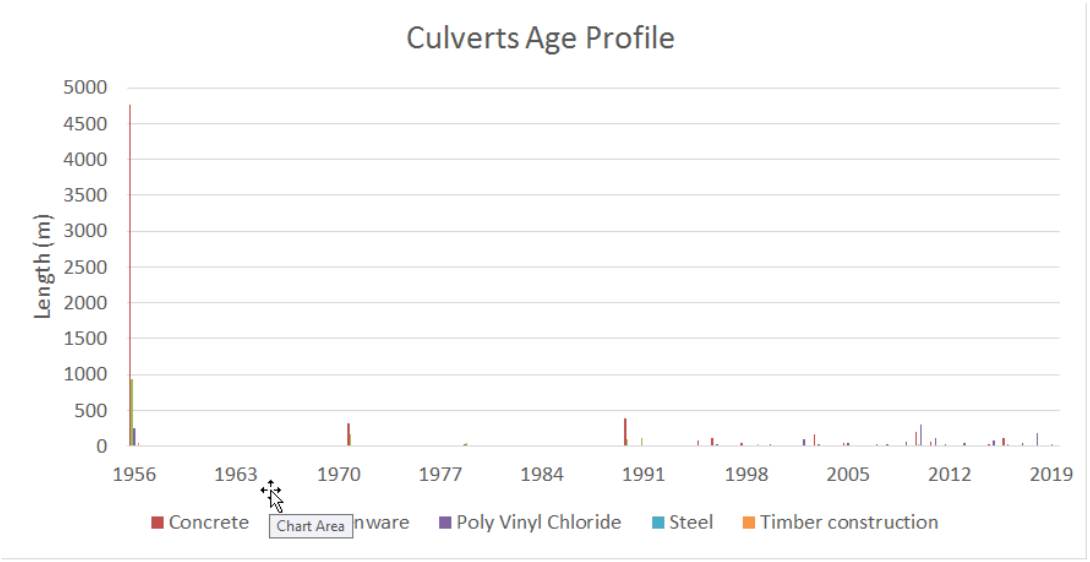
Culverts

Council has 730 culverts. The sizes and types of the culvert asset group are shown in the table below, with the figure providing an expected renewal date based on the age distribution and lives as assumed in the valuation:

Table 5.9 Sizes and Types of Culverts by Material

Diameter (mm)	Conc	EW	PVC	Steel	Timber
<300	181	82	38	1	
300 - 400	158	25	51	1	
400-500	58	1	5	1	1
500-1000	96	1			1
1000-2000	22		12		1
>=2000					
Total	**515**	**109**	**106**	**2**	**3**

Figure 5.10 Age Profile of Culverts by Installation Date



This highlights that some additional effort will be needed to improve understanding or remaining life and expected renewal dates, given the assumed installation date of 1956 (of approximately $20 million).

Key Messages – Culverts and Sumps

- Most of the value in the drainage group is culverts which total 9.5 km in length.
- Actual and estimated construction dates and assumed valuation lives suggest that most will need to be replaced around the mid-2030s – further work is needed to better understand this issue.

5.2.5 Footpaths and Cycleways

There are approximately 500 km of footpaths and 20,126 vehicle crossings within the City.

These assets have a replacement cost value of $109.8 million and an annual depreciation of $2.73 million, most of this relating to footpaths.

The table below outlines the lengths of footpaths by surface material, and shows the increase in concrete footpaths from 2014 to 2023.

Council has designated part of the road pavement in some streets as cycleways and also has a number of separated off road cycleways, managing these as part of the footpath network.

In 2014, Council changed its focus to renew all footpaths in 100mm thick concrete. All recent contracts continue to implement this policy decision.

A number of shared walkways are in place (77 sealed walkways of total length 7.3 kms), provided historically as part of subdivisions to allow users to connect between long 'blocks', improving accessibility.

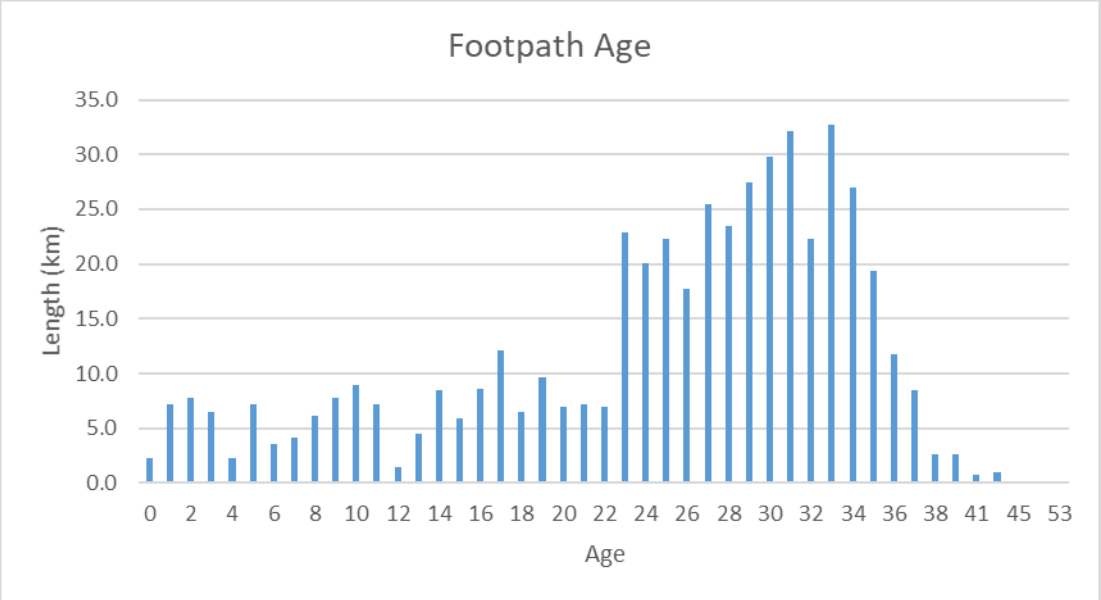
The footpath network by materials and age is shown below:

Table 5.10 Footpath Network by Materials

	2014		2017		2020		2023	
Material	**Length (km)**	**%**	**Length (km)**	**%**	**Length (km)**	**%**	**Length (km)**	**%**
Asphalt	305	61	282.0	56.5	280.8	56.0	269.6	54.0
Concrete	161.2	32.5	185.0	37.0	194.2	38.7	205.9	41.2
Metal	20.8	4.2	19.0	3.8	18.1	3.6	16.9	3.4
Other	10	2.0	12.5	2.5	8.2	1.6	7.1	1.4
Total	**497**		**500**		**501.3**		**499.6**	

The overall age profile and distribution by material type are shown in the figures below:

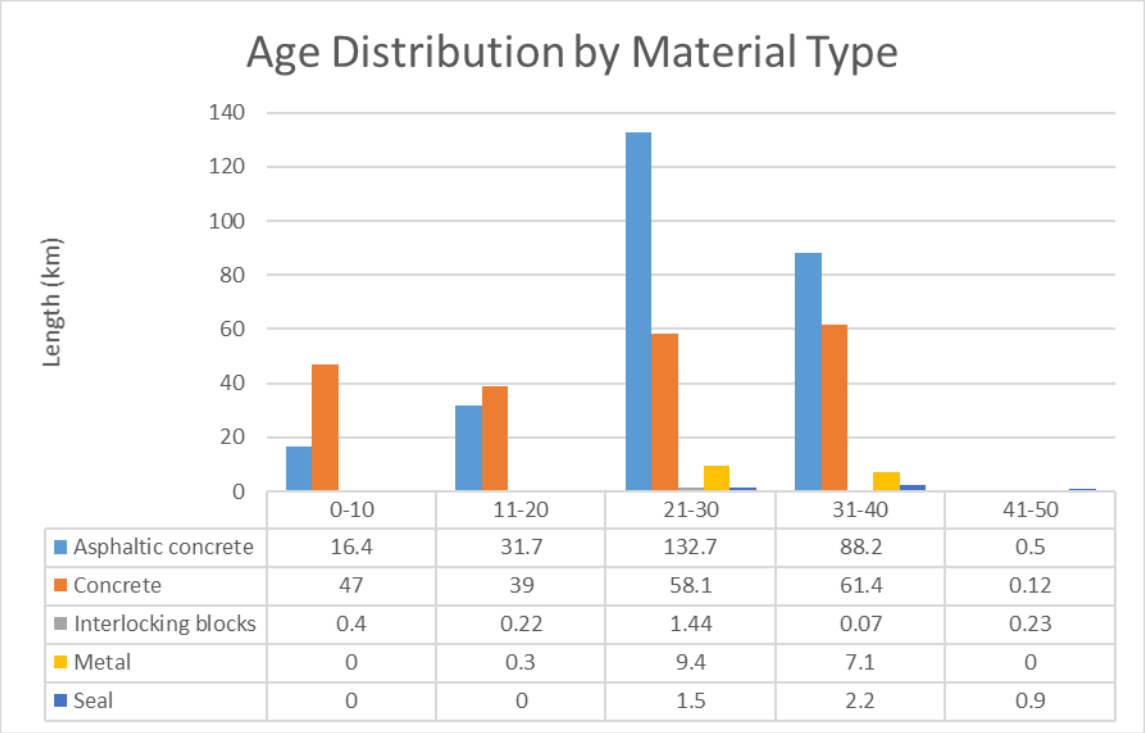
Figure 5.11 Footpath Age



Again, this shows that there are reasonably large lengths of a similar age, which suggests that a renewal strategy to smooth peaks will be required. Existing AC paths with an expected life of around 30 years will naturally require replacement earlier than concrete paths of similar age.

The figure below shows that a significant proportion of the total footpath network comprises AC paths that are older than 20 years, indicating an investment peak will be needed in the coming decade and beyond.

Figure 5.12 Footpath Age Distribution (Years) by Material Type



	0-10	11-20	21-30	31-40	41-50
Asphaltic concrete	16.4	31.7	132.7	88.2	0.5
Concrete	47	39	58.1	61.4	0.12
Interlocking blocks	0.4	0.22	1.44	0.07	0.23
Metal	0	0.3	9.4	7.1	0
Seal	0	0	1.5	2.2	0.9

Key Messages – Footpaths

- The footpath network is around 500 km, valued at $92 million and largely asphaltic concrete whose surfaces are mostly older than 20 years.
- A significant renewal programme for asphalt paths will be required over the next 10-15 years.

5.2.6 Traffic Services

This asset group includes streetlights, traffic signals, signs, delineation, and railings all of which make an important contribution to road safety.

Streetlights

Council has a range of lighting assets. Many of the assets are on Council owned poles and others are on those owned by the local Lines Company.

Under veranda lighting (mostly in the CBD) is generally maintained by council as a community good but electricity costs are paid by the shop owners. Various other amenity lighting is also utilised including community applications and in carparks.

Note that lights on state highways that are owned by Waka Kotahi NZ Transport Agency but are maintained by Council on a cost recovery basis.

Lighting luminaries are now mostly LED, purchased as a bulk order and consequently a bulk renewal date in around 17 years is likely.

There is an equal mix of octagonal precast poles and galvanised steel ICC owned poles with most poles being a ground plant rather than shear based poles.

Invercargill has most of its lights on ICC poles and also a number on outreach brackets or arms off power poles owned by the electricity network provider.

Streetlighting assets have a replacement cost value of $25.2 million and an annual depreciation of $684,000, most of this relating to poles and lamps.

The following table reflects current pole ownership:

Table 5.11 Pole Ownership

Owner of Poles	Quantity	ICC Lights	Under Veranda
Local Authority (ICC)	4,467	4,804	1,124
PowerNet	1,089	1,089	0
NZTA Owned / ICC Maintain	644	733	0

The condition of these street light poles is not very well understood, investigation into this in indented to be included in the WK151 Asset and Network Management.

Signs

The signs asset consists of 4,870 sign posts and 9,369 signs.

Many signs are located on fluted aluminium posts, however there are about 580 on power poles or lamp columns.

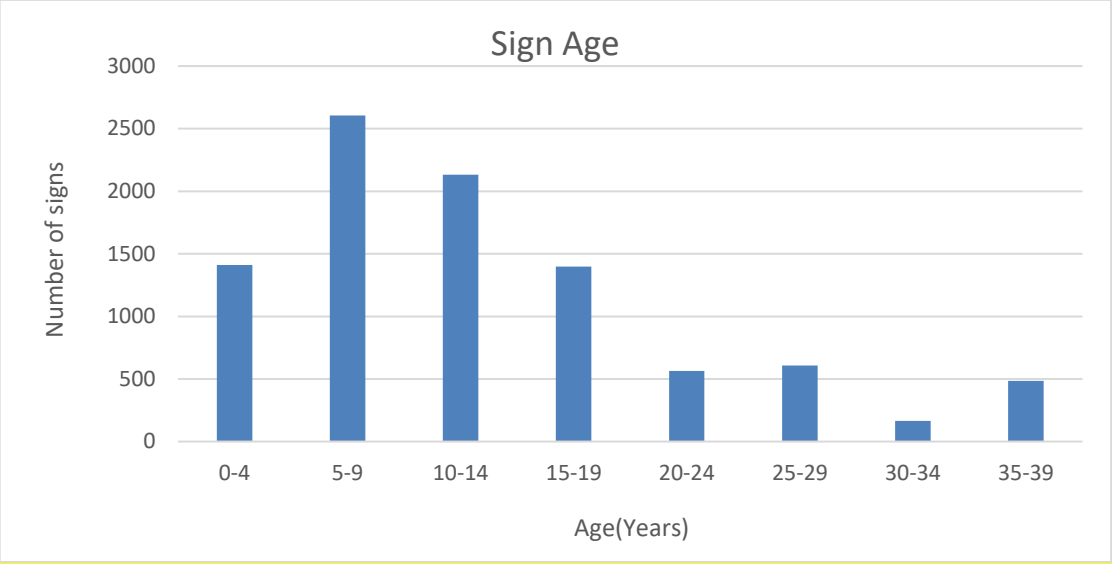
The different types of sign and their replacement cost values are shown below:

Table 5.12 List of Sign Assets

Sign Class	Quantity	RC Value $
Guide	19	$4,166
Hazard Markings	300	$56,831
Information General	2,793	$497,699
Information Miscellaneous	24	$2,957
Miscellaneous	555	$64,262
Motorist Services	57	$10,182
Permanent Warning	1,667	$265,134
Regulatory Chevrons	77	$31,873
Regulatory General	2,541	$337,633
Regulatory Heavy Vehicle	10	$1,612
Regulatory Parking	1,201	$82,403
Temporary Warning	6	$789
Tourist	20	$1,707
Warning Miscellaneous	99	$8,870
TOTAL	9,369	$1,366,119

The age of existing signs is shown in the following diagram, these compare to the average assumed life of 15 years in the valuation. This, and the age profile, suggests that signs are lasting longer than expected with around 1600 (17%) being older than 20 years. It would be appropriate to review the assumed lives at the next valuation.

Figure 5.13 Sign Age



Traffic Signals

Council owns 18 signal-controlled intersections and five signal-controlled pedestrian crossings. An additional 17 state highways intersections are managed on behalf of Waka Kotahi and are connected via a common SCATS platform within Council. This platform is being reviewed and alternatives being investigated by WTOC.

These sites are predominantly in the CBD area on Leven, Kelvin, Deveron Streets, together with Queens Drive and Elles Road.

SCATS is an area wide software control system for traffic signals used by most local authorities in New Zealand. The SCATS computer equipment is housed in Council's IT suite and is co-jointly owned by ICC and Waka Kotahi.

Local intersection signal controllers are connected to SCATS using Council owned copper cable and fibre optic cabling or modem controlled circuit from Spark.

Traffic signal coordination is used to minimise delays and stops within the roading network as well as helping to minimise fuel consumption and pollutant emissions through more efficient movement through intersections.

Coordination can also improve the capacity of a roading network as well as reinforce the roading hierarchy where appropriate.

Traffic signal assets have a replacement cost value of $3.6 million and an annual depreciation of $149,000.

Railings

Council has 57 Railing assets recorded in RAMM as detailed below.

Figure 5.14 Number of Railings versus Age (Years)

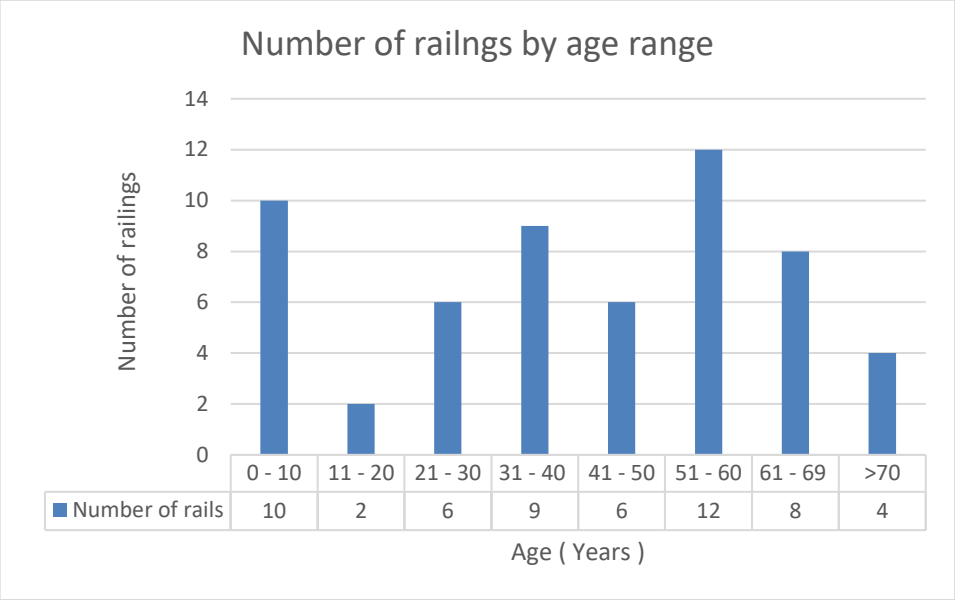


Table 5.13 Railings by Type

Railings Type	Number
Concrete	12
Concrete Post with Steel Tube	1
Guard rail	8
Hand rail	1
Other	1
Steel Flexbeam	7
Steel or Aluminium	2
Steel W Channel	13
Timber	11
W Section Guard Rail Steel	1

Key Messages – Traffic Services

- This group comprises streetlights, signs, traffic signals and railings.
- These assets are mostly within expected age bands – although many signs are older than their theoretical life.
- Street light lamps are new LED with low energy consumption.

5.2.7 Structures

The Council owns a total of 55 bridges including three large culverts, with a total value of approximately $100 million, including the ramps and rip-rap protection on the causeway approaches to the Tiwai Point bridge. Annual depreciation is $960,000, and the economic asset consumption level as measured by DRC is 52%.

Culverts included under the schedule of bridges have a waterway area greater than or equal to 3.40 m^2 in accordance with Waka Kotahi policy.

Several bridges are on joint district boundary roads and replacement responsibilities are shared with the Southland District Council.

Tiwai Bridge is by far the longest and has the highest single proportion of the replacement cost. It is a 27-span bridge 491m in length with significant causeway

accesses. The bridge has had significant repairs undertaken early in its life (30 years) and had a full beams and deck renewal due to a deteriorated post-tensioned slab which had cracked and failed.

Council has many box culverts which are relatively new (1990's) as part of flood retention schemes which provide a relatively new bridge stock, early in life and low risk construction.

The following are the construction types for bridges.

Table 5.14 Construction Type of Bridges

Structure Type	No	Owned and maintained by
Concrete Bridges	43	**Invercargill City Council**
Culverts (>3.4m2)	3	**Invercargill City Council**
Timber Bridges	6	**Invercargill City Council**
Concrete Bridges	3	**Shared with SDC**
Underpass	**5**	**Private**

The following are the longest five structures which represent 63% of the total length.

Table 5.15 Location of Bridges

Name	Length (m)	ONRC	Year Built	Lanes	RUL	Age	Expect Life
Tiwai Road	491	Secondary	1970	2	47	53	100
Dunns Road	174	Secondary	1987	2	64	36	100
Ferry Road	85	Access	1939	1	16	84	100
West Plains Road	61	Access	2002	1	49	21	70
Tweed Street North	56	Arterial	1972	4	49	51	100

The material types and age profile of the bridge stock are shown in the following figure.

Five bridges have speed and / or weight restrictions in place and these bridges are all on Access or Low Volume Roads.

Bridges are inspected regularly and are in good condition with minor maintenance being required.

Key Messages – Structures

- Most bridges are modern or constructed of concrete, with some older timber bridges on the network.
- Three bridges are on the City boundary and shared with Southland District.
- Five bridges have restrictions – all are on Low Volume or Access roads.

5.2.8 Carparking

The Parking Asset comprises of five off-street car parks, including Esk 1 and 2, 19 Don, 67 Don, Deveron and Leven Street (a multi-storey car park building) and 92 parking kiosks.

The Leven Street building is maintained by Council's property section and an internal lease agreement is in place.

On street metered car parks are placed about the CBD area.

Details of car parks, their capacity and fee charges are shown below:

Table 5.16 Carparks

Location	Car Park Spaces	Fees (as per the fees and charges)
1. Esk Street No. 1	42	$1.50 per hour
2. Esk Street No. 2	78	$1.50 per hour
	58	Permit - $70.00 per month
3. 19 Don Street	38	$1.50 per hour
4. 67 Don Street	40	$1.50 per hour
4. Leven Street	101	Casual - $1.50 per hour
	176	Permit - $100.00 to $120.00 per month
	34	P90 free
5. 30 Deveron Street	25	Permit - $100.00 per month
6. On street	740	Parking is charged in 15-minute increments and you receive 30 minutes of free parking each day. It costs $1 for a full hour, $3 for two hours, and $4 per hour after that, each day.

All parking meters have been replaced with a parking app and pay by plate on street equipment.

Parking kiosks have a replacement cost value of $742,559, and have been depreciated to only $71,320 DRC value.

Key Messages – Parking

- Parking meter replacement is completed.
- Location and number of parks and the returns provided may be influenced by change to the City Centre and the ICL development with 700^{+} car parks.

5.2.9 Other Assets

The Council also manages street feature assets which include planter boxes, CCTV cameras and cabling, bollards, columns, stonewalls, seating, rubbish bins and other streetscape features. These have a value of around $2 million and annual depreciation of $77,944.

The $20m upgrade of Don and Esk Street focused on high quality finishes, which has significant street furniture and other assets in this category have not been added to the asset the RAMM data base. But is included in the financial asset valuations.

Key Messages – Other Assets

- These include a range of diverse assets, including street furniture, that all need to be managed.

5.2.10 Public Transport Assets

This section covers public transport assets managed within this activity.

Council owns a total of 57 bus shelters with a replacement cost value of $0.7 million, with private shelters also available to passengers using the service.

Table 5.17 Bus Shelters

Type	Number	RC Value
Glass bus shelters	26	$304,330
Wooden shelters	22	$278,969
Old type metal bus shelters	3	$38,041

In addition, bus stop signs, seats, markings and associated infrastructure serving the public transport function are included in other asset groups above, such as Signs.

Council has delegation for managing Public Transport Services and providing shelters is part of that service.

New routes were implemented in 2021. Significant investment to the shelters replacements and new shelters are being implemented around Invercargill Central to assist with the changes.

Some of the public transport assets are poorly recorded and a detailed analysis of the likely lifecycle costs is required to clearly identify if their future replacement will be required and how this replacement would be funded. The community has high expectations of these assets. This valuation reflects the low level of asset information available. An improvement programme item is included to more clearly review this area.

Key Messages – Public Transport

- PT assets comprise a range of bus shelters, with some being privately owned.
- Further assessment and analysis of the assets will be required.

5.3 CRITICAL ASSETS

5.3.1 Asset Criticality Criteria

Critical assets are "those which have a high consequence of failure, but not necessarily a high probability of failure". Critical assets typically require more proactive management to minimise or eliminate this risk, even though the risk may occur infrequently.

Criticality should relate to the numbers of customers affected should the asset fail or no longer be available for service[26], and road hierarchy is a good indicator. A further consideration is "critical customers" – such as hospitals, emergency services, etc. where hierarchy is not the only determinant. Criticality needs to take these groups into account.

Asset criticality data is to be used in establishing priorities for asset management decisions, including renewal programmes or asset inspection / monitoring frequencies as well as capital investment decisions.

Definitions of asset criticality levels are given in the table below.

[26] A good example is the Auckland Harbour Bridge, with the consequences of a crash in September 2020 that closed 4 of the 8 lanes for several weeks showing just how critical this structure is to the Auckland network. The incident itself was regarded as a "freak" occurrence.

Table 5.18 Asset Criticality Criteria

Criticality Rating	Asset Importance	Consequence of Failure
5	**Extremely important.** The asset serves the most important city-wide function for this network or asset portfolio and is essential to ongoing operation (e.g. single water treatment plant, a single bridge link to the city, regionally significant park, Council HQ building, etc.)	**Catastrophic**. Failure would have severe and long-lasting adverse impacts on many if not most of ICC's customers and stakeholders, affecting outcomes such as public health and safety, economic wellbeing, and environmental sustainability. Availability of suitable alternatives is limited.
4	**Very important**. The asset serves a major function within the network (e.g. an arterial road, large trunk main, one of a small number of water reservoirs in the city, Museum, etc.)	**Extreme**. Failure would have major adverse impacts on many customers and stakeholders; and / or significant adverse impacts on the economy and / or the environment.
3	**Important.** The asset serves an important suburban function (e.g. a Collector road, minor pumping station, distribution main, suburban pool, park, housing or community building)	**Major.** Failure would have some adverse impacts on significant numbers of customers, and/or some adverse impacts on the local economy or the environment.
2	**Minor importance.** The asset serves a primarily local function (e.g. a local road, pipe serving several streets, small community facility)	**High.** Failure would have minor adverse impacts on some customers; and / or minor adverse effects on the local economy or the environment.
1	**Not important**. The asset serves a minor local function (e.g. a water pipe serving a single street, small local reserve, etc.)	**Moderate**. Failure would have little to no adverse impacts on customers and no impact on the local economy or environment.

5.3.2 Identification of Critical Assets

The Transport Activity provides for mobility and access for the City for the various modes of transport. The road corridor also provides access corridors for other utilities.

The One Network Road Classification (ONRC) provides the road corridor hierarchy with Arterial and Primary Collectors the more critical assets in ensuring resilient and reliable access. Council has an extensive grid network which provides many alternative routes making the network highly accessible.

State Highways also bisect the City and provide the regional links together with primary access to the Port. These assets are not managed by Council.

General criticality ratings are provided below:

Table 5.19 Identification of Critical Assets

Asset Group	Key Asset	Criticality Rating
Road Pavements	Arterial and Primary Collectors	3
Kerb and Channel	Arterial, Primary and Secondary Drainage Paths	3
Unsealed Pavements	Property Access - Some Access LV roads are singular access but limited property access	2
Footpaths	CBD and shopping areas	3
Traffic Services	Arterials and Primary Collectors	2
	All signals controllers or SCATS full failure	4
Structures and Drainage	Tiwai Bridge (sole access to the NZAS Smelter)	5

	Stead Street Stopbank - Sea protection to Airport and primary access to Otatara	5
	Primary and Collector Bridges	3
	Lindisfarne Bridge (critical sewer pipe access)	4
	Mersey Street bridge (critical sewer pipe access)	5
	Queens Drive West (watermains)	4
Carparking	All assets	1
Other Assets	All assets	1

Safety and security are key community outcomes and the key assets assisting in delivering these are traffic services (including street lighting). Whilst the loss of any one asset is not critical in itself, a collective long term failure would deem them as more important.

Key Messages – Critical Assets

- A 5-level asset criticality scale has been developed.
- This can be linked to ONRC category and the type of asset – bridges are more critical than pavements.
- The most critical assets (level 5) include the Tiwai Bridge and Stead Street Stopbank.
- Critical assets must be proactively managed to avoid the possibility of asset failure or service disruption given the high consequences this would have.

5.4 ASSET CONDITION

5.4.1 Condition Inspections and Surveys

The condition assessment of pavements is undertaken using:

- RAMM visual rating inspections
- High speed data collection (roughness, rutting and macro texture)
- Skid resistance surveys
- Falling weight deflection (FWD) surveys

The surveys are undertaken frequently to ensure accurate data is used for sealed surface and pavement modelling to develop renewal modelling programmes (JunoViewer) to feed into the LTP cycle.

The surveys are based on the ONRC hierarchy with higher classifications having more complex and complete surveys undertaken.

Footpath condition has been rated in accordance with the methodology developed by the New Zealand Institute of Highway Technology.

Footpaths are surveyed typically every five years with council staff undertaking more frequent reviews in the other years where needed, of the lowest condition footpaths to assess if they have changed category. These ratings whilst useful do not provide enough data to accurately model renewal cycles but contribute to engineering judgement.

Detailed bridge inspections (full structural inspection) of all bridges are undertaken by a bridge consultant on a six year cycle in accordance with Waka Kotahi guidelines, considering factors such as structural integrity, defects, safety and appearance.

These are specialised and detailed inspections, and include ratings where strength is less than the standards.

Council does not currently use any assessment tools other than visual inspections for sealed roads, carparking or traffic services. Some Roadroid and video inspections for sealed and unsealed roads are being trialled to establish a baseline for considering the level of service of these roads.

5.4.2 Sealed Roads Condition

Sealed road condition relates to the surface and pavement layers, with data relating to condition parameters presented below.

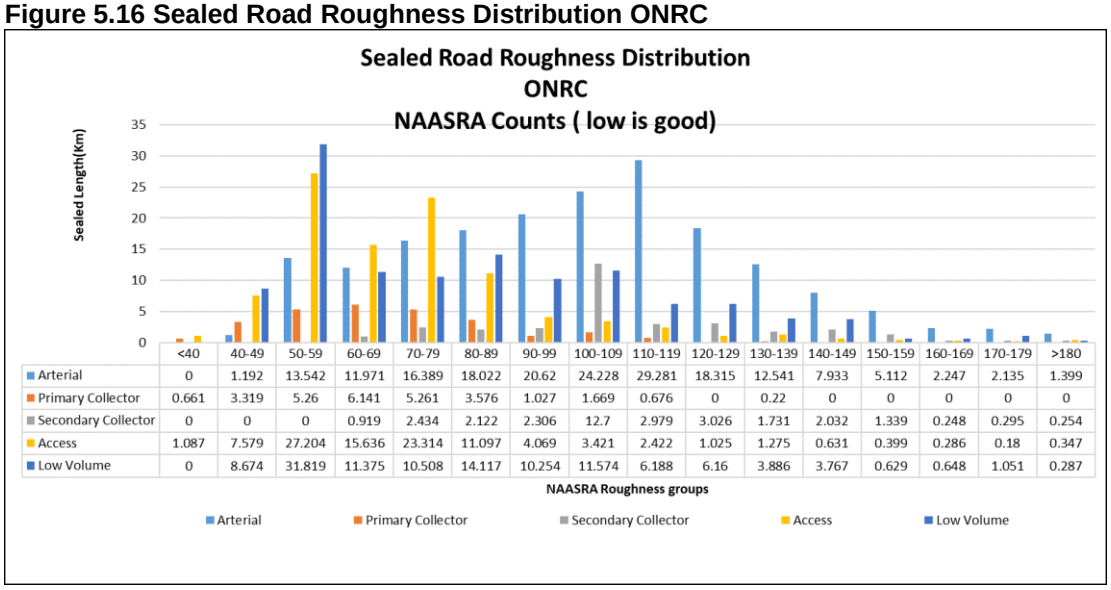
Pavement Roughness and Smooth Travel Exposure

These were introduced and discussed in the Strategic Case in Section 2.6.2.

Data from the RAMM database and the Te Ringa Maimoa Performance Measure Reporting Tool is presented below. Roughness data shows that:

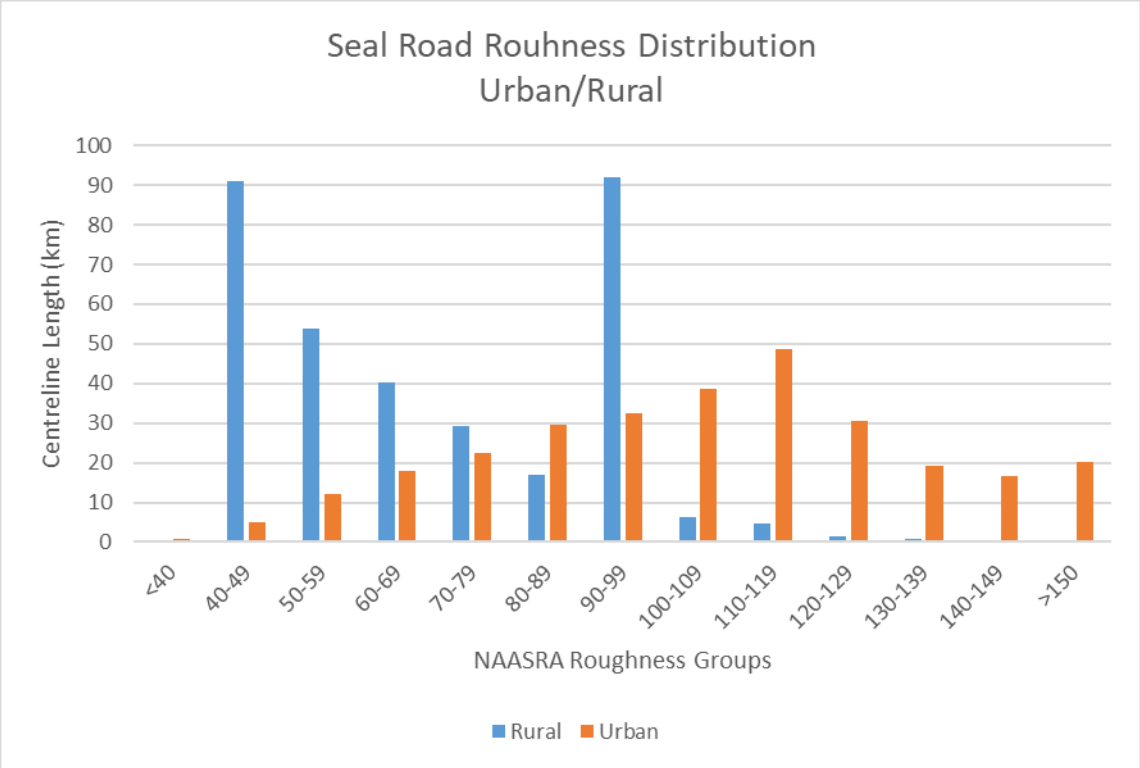
- Higher use roads are less rough than low volume roads.
- Urban roads are typically rougher than rural roads due to the effect of service trenches.

Figure 5.16 Sealed Road Roughness Distribution ONRC



	<40	40-49	50-59	60-69	70-79	80-89	90-99	100-109	110-119	120-129	130-139	140-149	150-159	160-169	170-179	>180
Arterial	0	1.192	13.542	11.971	16.389	18.022	20.62	24.228	29.281	18.315	12.541	7.933	5.112	2.247	2.135	1.399
Primary Collector	0.661	3.319	5.26	6.141	5.261	3.576	1.027	1.669	0.676	0	0.22	0	0	0	0	0
Secondary Collector	0	0	0	0.919	2.434	2.122	2.306	12.7	2.979	3.026	1.731	2.032	1.339	0.248	0.295	0.254
Access	1.087	7.579	27.204	15.636	23.314	11.097	4.069	3.421	2.422	1.025	1.275	0.631	0.399	0.286	0.18	0.347
Low Volume	0	8.674	31.819	11.375	10.508	14.117	10.254	11.574	6.188	6.16	3.886	3.767	0.629	0.648	1.051	0.287

Figure 5.17 Sealed Road Roughness Distribution Urban / Rural



Smooth travel exposure (STE) is a measure of the amount of traffic "exposed" to roughness levels above a particular threshold, typically 150 NAASRA counts.

STE graphs below describe the quality of the road surface that customers experience – higher numbers in this graph mean smoother travel.

It can be seen from the STE trends that Invercargill is performing similar to its peer groups and national averages, but over time performance has decreased across all hierarchy classes.

Peak roughness is also a good indicator and Invercargill is dropping in performance against its peer group.

Customer expectations as communicated through the customer survey indicate that residents have an expectation for even smoother roads.

Given the trends, the direction is to maintain current performance and not continue with the downward trend.

Invercargill City Council has sweated the asset to a point where a change in the current level of investment in rehabilitations and resurfacing is required. Unfortunately, customers focus on specific locations (e.g. State Highways) is understood to cloud the customer survey results.

Figure 5.18 Smooth Travel Exposure

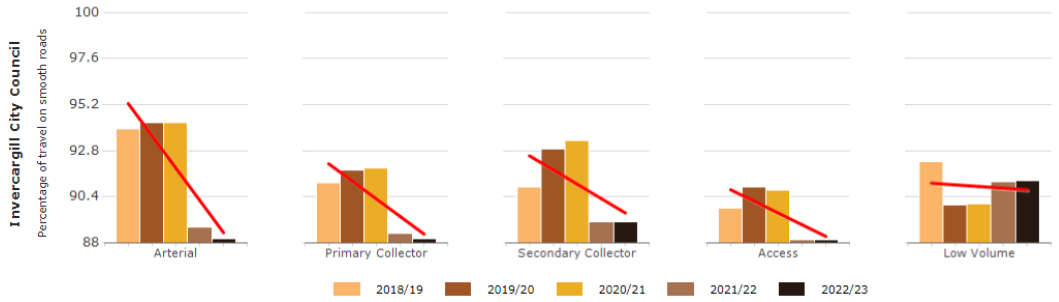
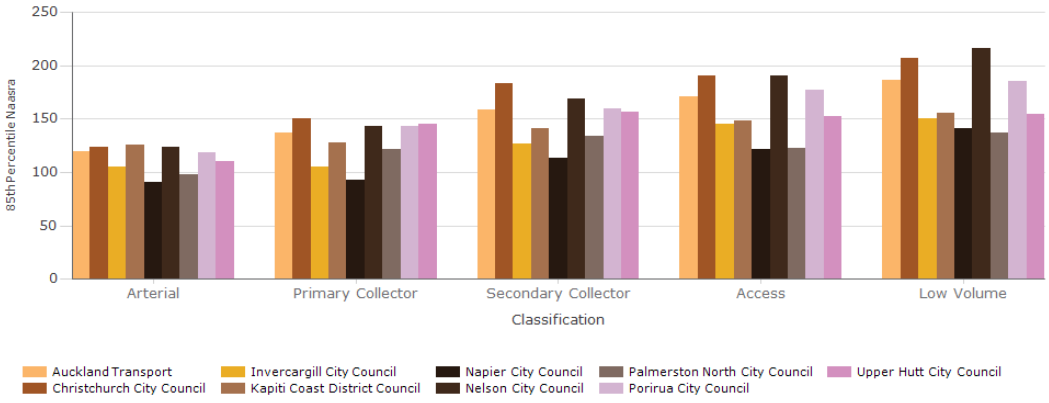
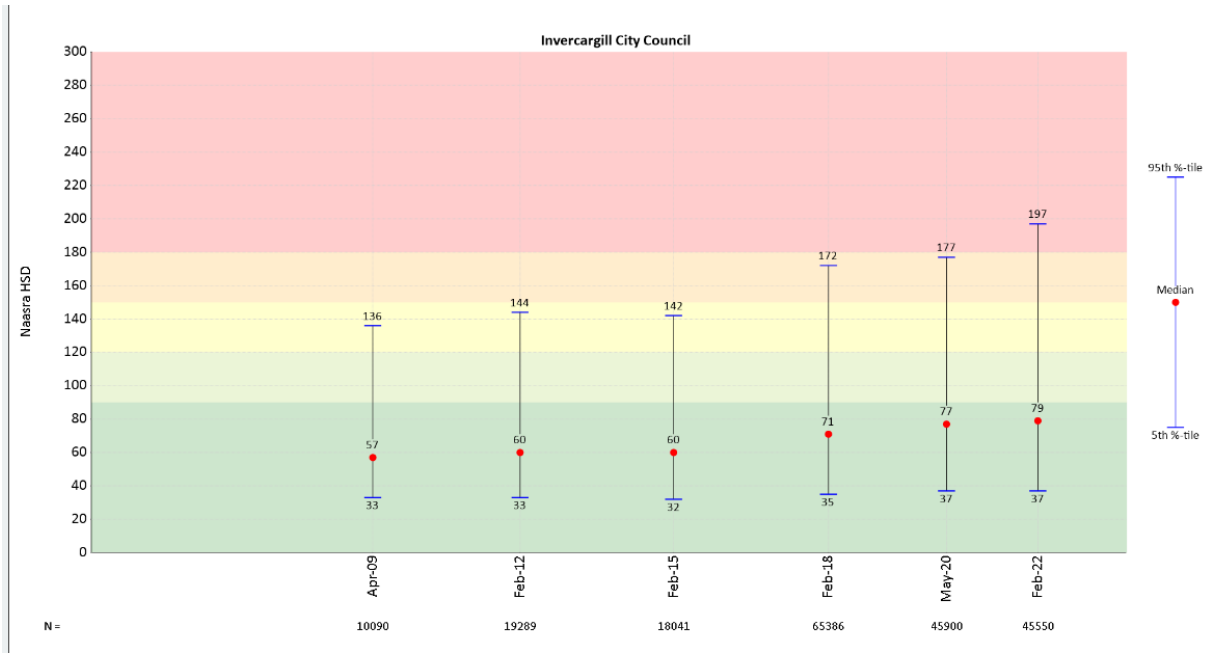


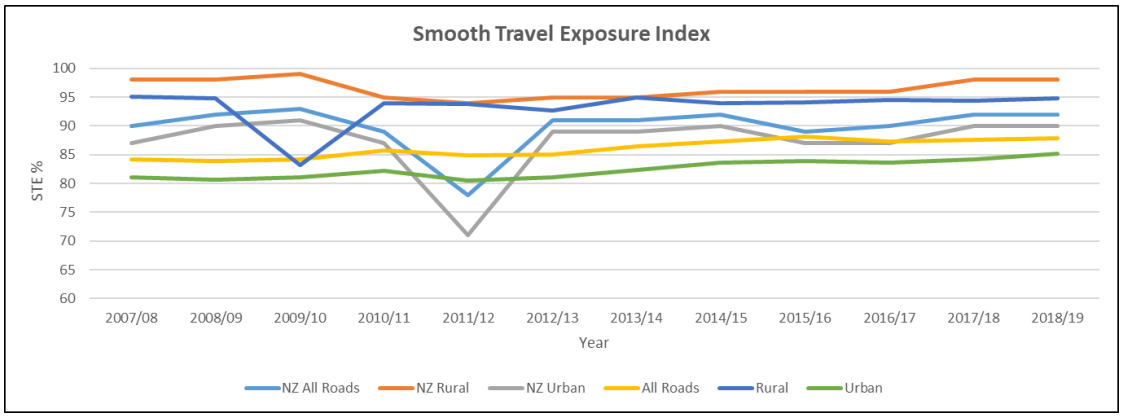
Figure 5.19 Amenity Customer Outcome 2: Peak Roughness - Urban Sealed Roads



Smooth Travel Exposure results in the figure 5.20 below are increasing marginally over time and the standard deviation is also spreading, investigation into the cause of this is required.

Figure 5.20 STE Condition Index by Years

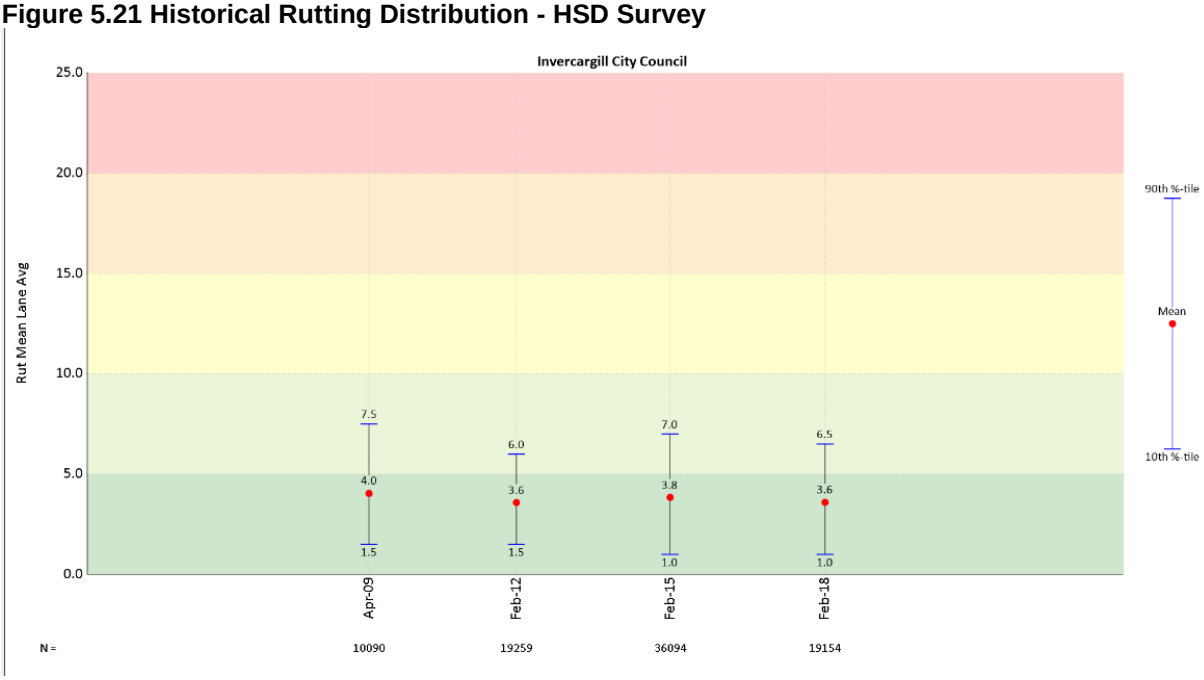




Rutting

The existing rutting data from the latest survey does not indicate any major rutting issues on the network. The historical rutting data from the available high-speed surveys also show rutting to be in in a very stable stage, limiting the chance of a rapid increase in pavement failure in the near future.

Figure 5.21 Historical Rutting Distribution - HSD Survey

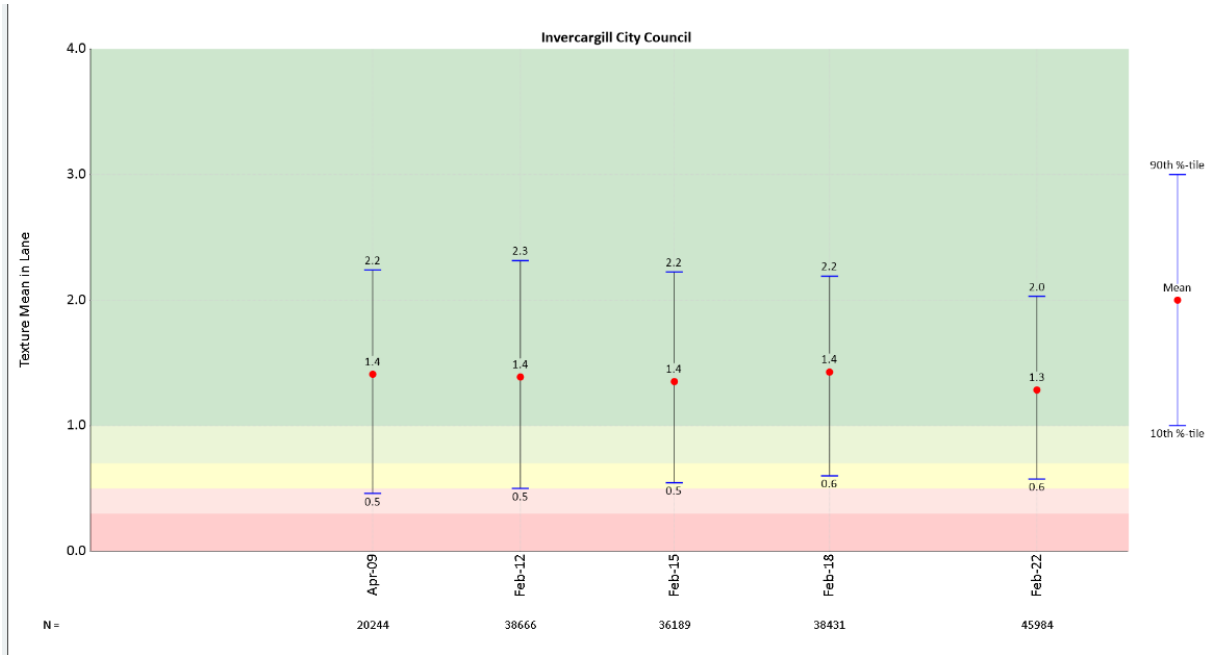


Texture

Macro texture is required to minimise the progressive loss of skid resistance with increasing speed on wet roads due to contact between vehicle tyres and the road surface. The minimum macro texture requirement is 1.0mm and 0.5mm respectively for chip seal and asphalt concrete finished surfaces

The following figure displays average macro texture depths (MPD) on the sealed road network, with the majority of the roads surveyed being over 1mm MPD and generally being maintained at good levels over time.

Figure 5.22 Average Texture Profile Depth (mm)

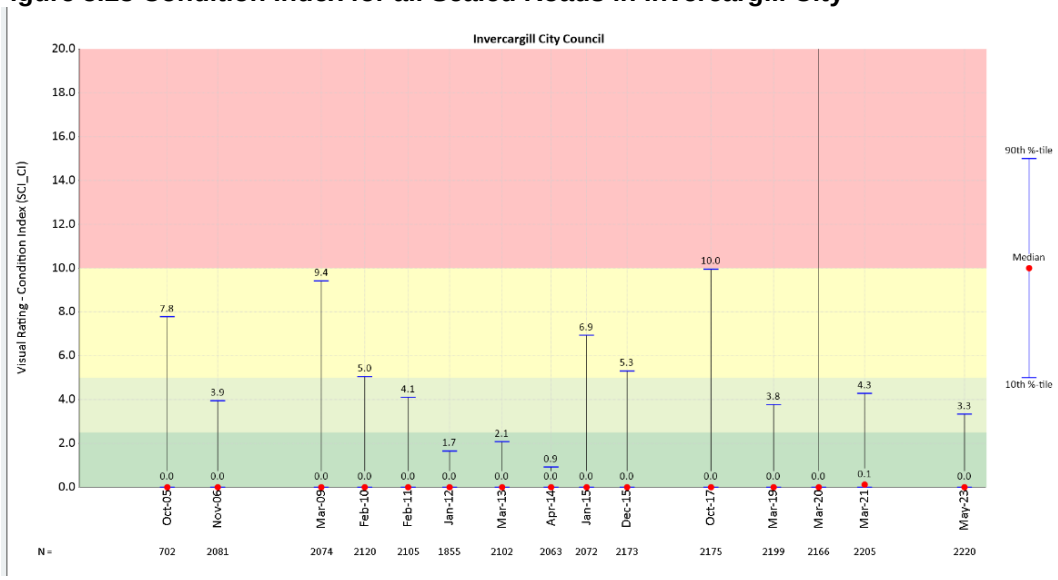


Condition Index

The Condition Index (CI) is a numerical index which is used to indicate the overall general condition of the pavement surface. The method is based on a visual survey of the number and types of distresses in a pavement. The result of the analysis is a numerical value between 0 and 20, with 0 representing the best possible condition and 20 representing the worst possible condition.

While there appears to be a data inconsistency in 2014/15, the City's network does appear to be improving on rural roads and the standard deviation on the graph below indicates a cyclic trend on urban roads.

Figure 5.23 Condition Index for all Sealed Roads in Invercargill City



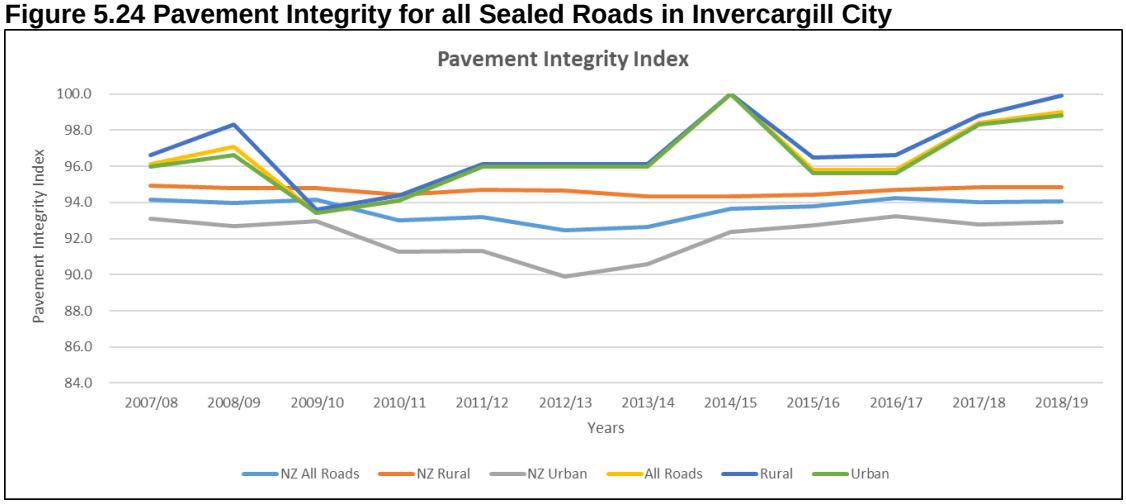
Pavement Integrity Index

The Pavement Integrity Index (PII) is a combined index of the pavement faults in sealed road surfaces used widely in New Zealand. It is a 'weighted sum' of the

pavement defects divided by total lane length. PII combines surface faults (CI) with rutting and shoving. A High PII corresponds to high pavement integrity. This index combines the information gathered from the condition rating survey with the measurements recorded during the high speed data surveys.

The following figure provides a slightly different view to the CI above, as it takes into account a different range of parameters. Again, the data inconsistency in 2014/15 is evident, but otherwise the network is seen to be in a stable situation and in better overall condition than the peer group and national averages. **The conclusion that can be reached in the Pavement Performance Model report (Appendix 9) reviewing these graphs is that the surface is probably in worse condition than the pavement structure**.

Figure 5.24 Pavement Integrity for all Sealed Roads in Invercargill City



Note also that the JunoViewer modelling of the network also that the network has been sweated and is currently in reasonable condition and but will quickly decline if not properly invested in.

Key Messages – Sealed Roads Condition

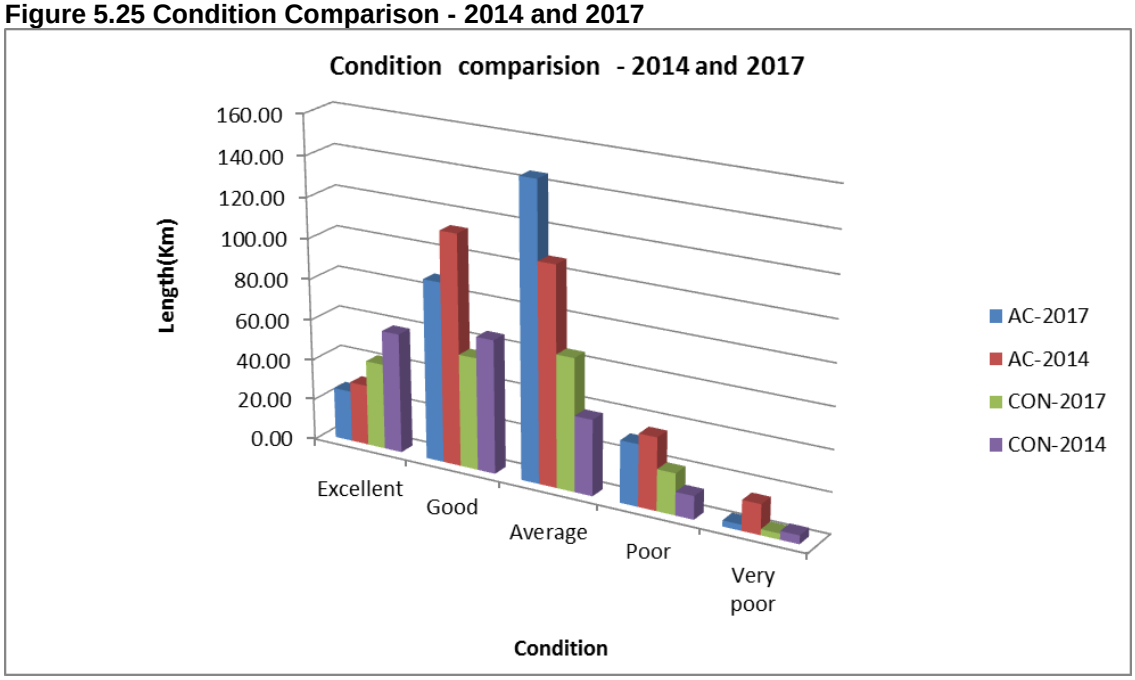
- Invercargill's network is smoothness and roughness are on a worsening trend in comparison with our peers and the national average.
- Other indicators, i.e. rutting, texture, CI and PII, are showing good, stable performance over time, indicating that the pavement has been managed well to date, surfacing needs to be undertaken to retain good pavement results.

5.4.3 Footpaths Condition

Invercargill's footpaths show good condition from the recent survey (2017) and similar when compared to 2014. A new condition survey is being undertaken at the time of writing this plan. The number of very poor footpaths indicates that this asset group does not have condition issues, despite its age profile. The latest footpath rating survey had not been completed at the time of preparation of this plan.

It is expected that renewals will start to address the poor and very poor rated footpaths, and be able to keep these within the level of service requirements. It is relatively easy to manage and maintain condition, as it is easily viewed and repairing short lengths is one way to limit renewal spending on the asset.

Figure 5.25 Condition Comparison - 2014 and 2017



Key Messages – Footpaths Condition

- Despite the age profile suggesting renewal need over the next 7-12 years, condition data suggests that the network is largely being managed within acceptable condition levels.

5.4.4 Structures Condition

Bridge inspections have not indicated any significant condition issues with the maintenance demands being relatively routine and minor. They are inspected on a regular basis by trained Council staff with general inspections every two years (Appendix 19).

A number of bridges are twin box culverts and were installed in the 1990's and are simplistic in design. Tiwai Bridge is a bridge where regular detailed inspections have been undertaken and with a new deck it is in good condition. The piles on Tiwai are an area where ongoing monitoring and inspections are planned. Some repairs have been undertaken and a forward inspection and remediation programme is budgeted. The Tiwai bridge repair approach has been reasonably well defined as earlier repairs have successfully detailed the methodology for undertaking this work.

These inspections have not graded the bridges into condition classes.

Key Messages – Structures Condition

- Bridges are generally in good condition with no major issues identified.
- Tiwai Bridge does require ongoing monitoring, due to the nature of its construction and its location in a marine environment.

5.4.5 Traffic Services Condition

No formal condition rating of these assets has been undertaken and again this is seen as an area for improvement.

Street light poles are still relatively new compared to their asset lives with the only area where more inspection could be undertaken being concrete spalling on precast concrete poles. Some splitting of the concrete where the cover is relatively thin has been observed but this has not led to any failures although faster deterioration is occurring.

With the installation of LED lamps now completed, each pole has been inspected and rated and any works required recorded during the LED installation process.

Traffic signals have regular maintenance and the major condition issue could be the controllers as significant items. These controllers have had a number of renewals and are relatively new, therefore condition is not seen as a significant issue. During each routine maintenance observation, traffic signal lanterns are viewed to ensure they are not damaged.

Key Messages – Traffic Services Condition

- While this asset group is not formally condition rated, the assets are considered to be in acceptable condition.

5.4.6 Condition Monitoring Frequencies

The dates of the last survey and frequency are:

Table 5.20 Condition Monitoring Survey and Frequency Results

Name	Method by Whom	Frequency	Last Survey
RAMM Rating Visual Inspections	RAMM Visual	Every year	2022/23
Roughness Survey	Laser Profile Method	Two yearly	2021/22
Skid Resistance Survey	SCRIM	Two yearly	2021/22
Falling Weight Deflectometer (FWD) Survey	External Provider	Three yearly	2018/19
Footpaths - All	External Provider	Five yearly	2016/17
Footpaths - Poor and very poor	ICC Staff	Two yearly	2022/23
Bridges			
• General Inspection	Bridge Inspector	Two years	2022/23
• Detailed Inspection	Bridge Inspector	Five years	2022/23
• Special Inspection for posted bridges	Bridge Inspector	As determined by the Engineer	2023 Ferry Road and West Plains Post Flood
• Routine Inspection	Council Staff	Regular basis	2023/24
Carparking	Visual by Staff, contractors	Ongoing	2023/24
Traffic Services	Visual by Staff, contractors	Routine Contract Inspections	2023/24

* 2021/22 General Bridge Inspection delayed due to Gisborne Floods

5.5 ASSET CAPACITY AND PERFORMANCE

5.5.1 Network Performance

Network performance currently offers a high level of service due to relatively low traffic volumes.

Historic traffic modelling has indicated that most intersections operate at a high level of service with the greatest pressures where they join to State Highways (Gabites

Porter Modelling Reports 2011). An updated model is an improvement planned to continue to be able to monitor performance.

A draft Network Operating Framework, has been undertaken in conjunction with Waka Kotahi NZ Transport Agency, to establish a clear functional approach for the network, including active transport and public transport modes, and make explaining the ONRC and ONF functions of roads clearer to stakeholders. It would also assist with defining priority and providing input to establishing bypass roads and how the traffic, in particular the freight element, can effectively access and pass through Invercargill to the Bluff Port and other commercial areas. This will provide a better 10 year network focus for future plans. This is being further developed through an Integrated Transport Strategy to ensure future planning in each classification is appropriate.

5.5.2 Asset Capacity and Utilisation

Pavements

The road network has wide pavements and does not have traffic capacity issue, even at peak periods. The grid network and lane configurations provide capacity well in excess of demand. Travel times and reliability of travel indicate that Invercargill is well serviced by the roading network layout. No problem statement was identified which related to capacity or reliability.

Further work is required to monitor pavement strength capacity for heavy vehicles (50 Max and HPMV) as more access is utilised across the network. There has not been too much demand for heavy vehicles on unsealed pavements as good link roads are available, so these pavements have not been overly tested by increased loads. Requests for travel from the transport industry have been mostly achieved but timeliness for approval could be improved.

The State Highway provides a key through link for heavy vehicles for the City.

Structures

Bridges and culverts have sufficient strength on important transport routes allowing the use of 50Max vehicles across the network and HPMV on selected key corridors to access their destinations.

Drainage

Drainage capacity has not been a significant issue and surface flooding has been relatively minimal; where this occurs it is most often associated with detritus over sump and entry grates and a few under sized culverts. Some connections are identified as failing due to age but these are repaired as a maintenance item rather than as a system wide renewal. As stormwater pipe renewals are undertaken, sumps and connections are reviewed and replaced as required. Culverts will need to be monitored as they are a key drainage link in rural areas.

Carparking

Carparking is provided in all CBD areas and utilisation surveys indicate that parking is underutilised except for very short periods in specific locations. The perception of retailers is potentially different but Invercargill has an expectation that a carpark will be available outside any business. The Leven Street Buildings are underutilised by casual parking and this has seen a shift to offer permit spaces to secure income.

The new ICL development is likely to impact and change parking patterns and future consideration may be needed to highlight the optimum parking areas and demand as the city centre changes.

The need for allocating parks to all the sector groups (including the disability groups) will create additional pressure on parking.

Parking is available free close to the City Centre and may need further investigation to better manage the opportunities available to encourage PT usage.

Urban shopping centres have increased pressures on parking and these areas are managed through time restricted parking rather than investing in additional parking areas. The use of “charged” meter areas in busy suburban locations has not been considered but has potential to be effective but unliked by shoppers and retailers.

Key Messages – Capacity and Performance

- Network capacity in terms of available road space and congestion is not an issue for Invercargill.
- However, further work needs to be undertaken in investigating the use of the network by heavy vehicles – both pavement strength and route selection.
- Modal conflict is an issue for the network. A high level Transport Strategy should be undertaken and the draft Network Operating Framework (NOF) completed.
- Parking will need to be considered following the ICL development.

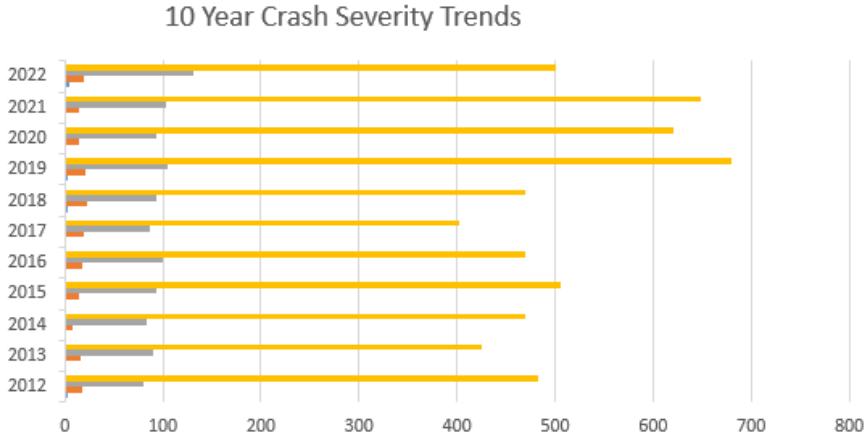
5.6 ROAD SAFETY

Safety trends were introduced and discussed in the Strategic Case in Section 2.6.1. Further details and information are provided here.

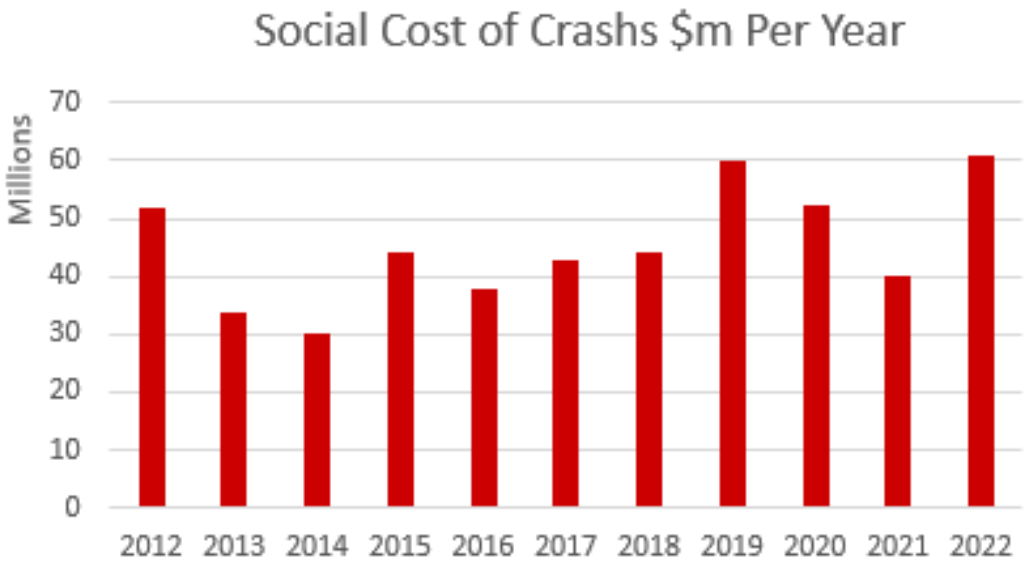
5.6.1 Crash Trends

The numbers of crashes by severity are shown in the following graph, the majority are minor or non-injury.

Figure 5.26 Ten Year Crash Severity Trends

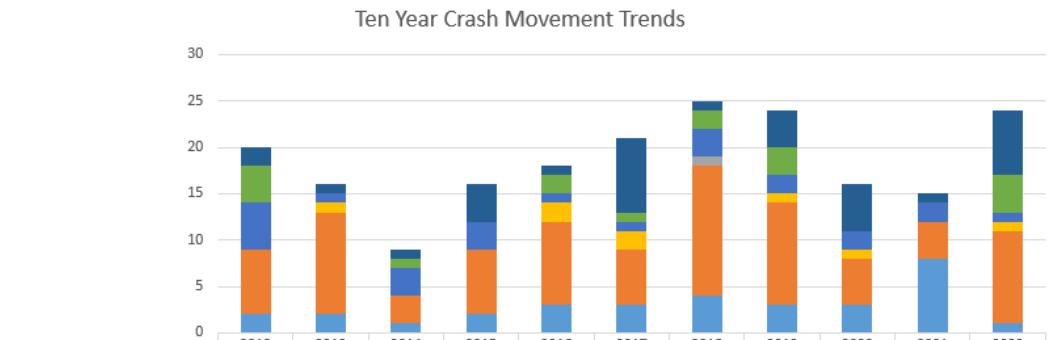


	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Sum of Non-injury count	482	425	470	505	469	402	469	679	621	648	500
Sum of Minor injury count	80	90	84	94	99	86	94	105	93	103	131
Sum of Serious injury count	17	16	8	14	18	20	22	21	14	15	19
Sum of Fatal injury count	3	0	1	2	0	1	3	3	2	0	5



Crash numbers by type are shown in the figure below, highlighting the dominance of crashes likely to be at intersections (crossing / turning and rear end).

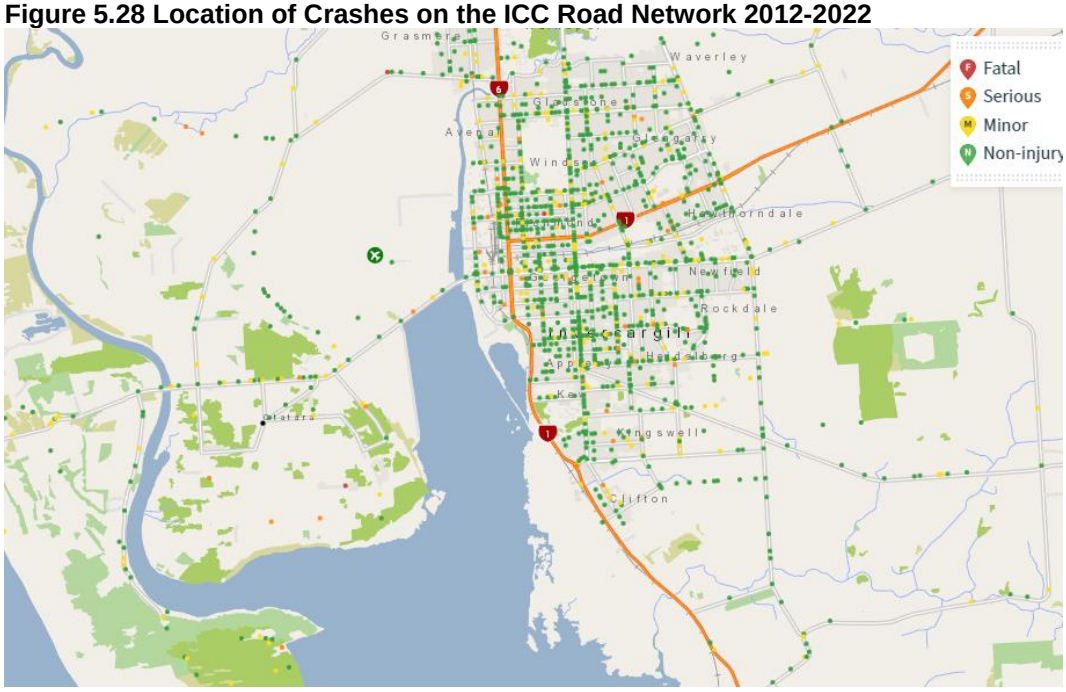
Figure 5.27 Ten Year Crash Movement Trends



	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Straight-Lost control/Head on	2	1	1	4	1	8	1	4	5	1	7
Rear end/obstruction	4	0	1	0	2	1	2	3	0	0	4
Pedestrian vs Vehicle	5	1	3	3	1	1	3	2	2	2	1
Overtaking	0	1	0	0	2	2	0	1	1	0	1
Miscellaneous		0		0	0	0	1	0	0	0	0
Crossing/Turning	7	11	3	7	9	6	14	11	5	4	10
Bend-Lost control/Head on	2	2	1	2	3	3	4	3	3	8	1

The locations of crashes on the ICC road network from 2012 to 2022 are shown below. The mapped crashes are colour-coded according to severity.

Figure 5.28 Location of Crashes on the ICC Road Network 2012-2022





5.6.2 ONRC Comparisons

Section 2.6 provided detailed information sourced from the ONRC reporting tool and Communities at Risk database.

The following two ONRC graphs show increasing trends for deaths and serious injuries and also the higher than expected Personal Risk for Access Roads. Invercargill has a higher profile than the national average and most of its peers.

These aspects are seen as part of the Safety problem statement in the ILM process.

Figure 5.30 Customer Outcome 1: Number of Serious Injuries and Fatalities (DSI)

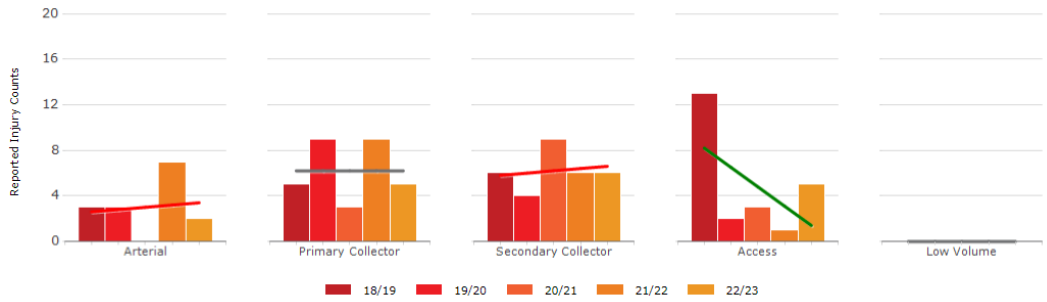


Figure 5.31 Safety Customer Outcome 3 - Personal Risk

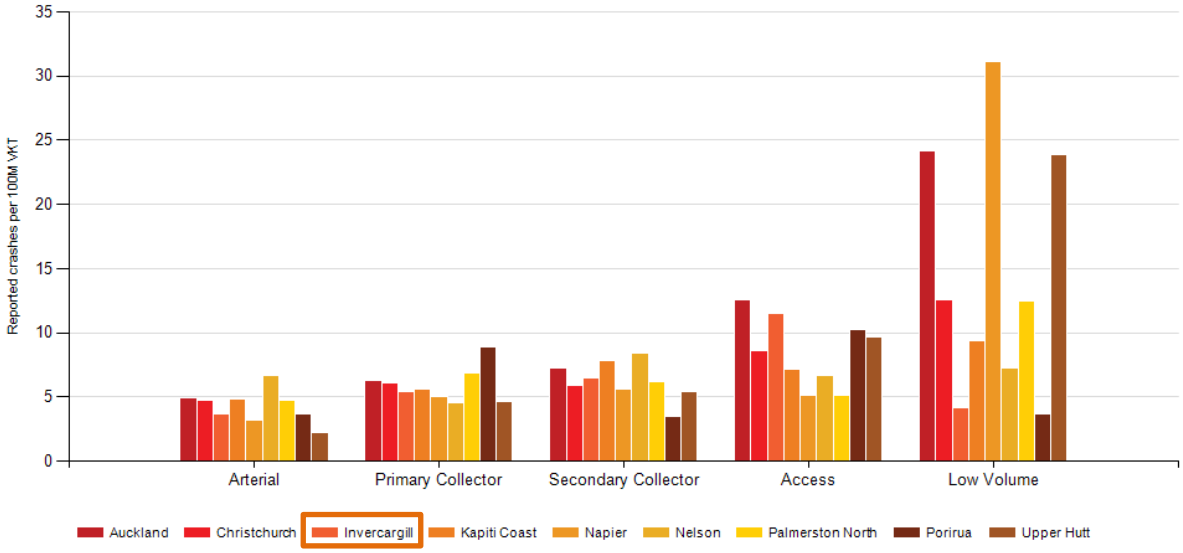


Figure 5.33 2022 Community at Risk Register – Invercargill Trend

	2017	2018	2019	2020	2021	2022
All deaths and serious casualties	47	31	28	29	29	21
Young drivers (aged 16-24yrs)	26	21	8	13	13	18
Alcohol and/or drugs	49	36	37	33	22	29
Speed (too fast for the conditions)	60	60	44	41	44	26
Urban intersections	15	11	7	8	9	12
Rural intersections	3	4	3	6	5	14
All intersections	3	2	1	1	1	1
Rural road loss of control and/or head-on	61	60	56	48	49	23
Motorcyclist involved	54	36	48	34	31	47
Cyclist involved	1	7	7	10	2	5
Pedestrian involved	1	7	9	14	33	27
Driver Distraction	58	8	19	16	16	11
Fatigue	56	60	40	40	42	51
Older road users (>75years)	14	8	15	9	5	4
Restraints (seatbelt not worn)	42	43	38	39	45	50

Figure 5.34 2022 Community at Risk Register – Peer Comparison

2022 Community at Risk Register	ICC	CCC	KCDC	Napier	Nelson	PNCC	PCC	UHCC
All deaths and serious casualties	21	62	59	44	42	19	64	56
Young drivers (aged 16-24yrs)	18	56	38	47	43	37	59	57
Alcohol and/or drugs	29	47	59	39	42	24	49	66
Speed (too fast for the conditions)	26	59	64	34	28	18	56	46
Urban intersections	12	34	48	27	41	25	60	47
Rural intersections	14	52	44	43	19	2	57	18
All intersections	1	11	49	8	16	3	59	30
Rural road loss of control and/or head-on	23	63	62	58	44	46	67	57
Motorcyclist involved	47	49	45	40	27	25	39	28
Cyclist involved	5	24	26	1	45	19	52	51
Pedestrian involved	27	39	62	14	43	28	63	65
Driver Distraction	11	40	58	42	4	18	28	71
Fatigue	51	63	64	46	58	53	47	68
Older road users (>75years)	4	34	27	19	5	61	53	10
Restraints (seatbelt not worn)	50	63	66	46	69	37	61	55

5.6.3 Summary of Key Road Safety Issues

- Crashes are associated with intersections
- The high ranking in the Community at Risk register – indicating a poor performance level

Safety is a significant performance issue for the network and is where a large increased step change in focus is required.

The disappointing aspect about the safety record is that there has been very little community concern or recognition that improvements are needed and that safety performance is unacceptable. Invercargill City Council and Road Safety Southland need to invest in more education within the region.

The more difficult aspect is that safety incidents are not occurring at specific locations but are more system wide and need behavioural inputs from the community to make improvements. This is possible as over the last ten years Invercargill and Southland have declined in intersections, cyclist, older road users and driver distraction. Improved in pedestrians and motorcyclists, which does indicate with good local and national programmes it can be achieved.

The Southland Councils and Waka Kotahi NZ Transport Agency need to focus on the Road to Zero campaign (from GPS 2021) and consider if the Southern Safety Influencing Group remains the appropriate mechanism for change.

Key Messages – Road Safety

- A step change is required for additional Road Safety effort and investment.
- Crashes are distributed throughout the city with an over-representation associated with intersections.
- The City has one of the worst rankings in the country's Community at Risk register.
- Lack of community concern for Invercargill's poor safety performance nationally.

5.7 SUMMARY OF ASSET TRENDS, ISSUES AND CHALLENGES

Key trends which are seen in the network include:

- The network is well established and well-structured for historic uses.
- Good alignment exists with ONRC and ONF.
- Journeys are being undertaken on the hierarchy appropriately.
- Asset condition is reasonable but aging.
- Asset performance measure are trend down when considered against the peer group.
- Pavements are performing appropriately and modelling indicates capacity is available.
- Critical assets are generally bridges that support other asset groups.
- Safety risks are over represented.
- Due to the historic wide layout of the network corridors the network has spare capacity.

The key issues include:

- A step change is required in safety improvements, particularly at intersections and for vulnerable users.
- Need to continue to manage maintenance and renewals to sustain the network.
- A focus is needed to ensure access for heavy vehicle routes and may need to focus some renewals on ONRC hierarchy where the traffic is directed.
- There is modal conflict in the network use

In summary, Invercargill has assets which in most parts are in good condition but aging, are generally being underutilised due to historical layouts but are robust and need to ensure they remain well managed.

The asset approach is to maintain pavements with a network portfolio view and utilise methods for resurfacing and rehabilitation to minimise costs. Typically these approaches are addressing travel lanes only i.e. resurfacing parking and bike lanes every second resurfacing.

The key challenges include:

- The need to develop and implement an integrated transport (and safety) strategy where a community behavioural change occurs which leads to improved and safer driving habits.
- Safety at intersections is a trend which needs to be owned as a community responsibility and be addressed through further implementing the Safe System Approach.
- Focussing on how maintenance and renewal can contribute to improvements is key to making more traction on having better outcomes. Utilising and focusing the Community programmes on the issues and align and collaborate with other Government Agencies (NZ Police, Worksafe, ACC, etc.) to ensure programmes connect and deliver suitable outcomes.
- Develop an understanding of when and how technology will impact on the network and be able to respond accordingly, just in time.

6. Sustainability, Risk and Resilience

6.1 SUSTAINABILITY

The Local Government Act requires Council to take into account the social, economic and cultural interests of people and communities, the need to maintain and enhance the quality of the environment and the reasonably foreseeable needs of future generations by taking a sustainable development approach. Sustainability can be defined as:

"Development which meets the needs of the present generation without compromising the future generation from meeting their own needs" (Brundtland Report, 1987).

Infrastructure assets ability to influence sustainability outcomes is highest during the planning and design phase. Asset type, location and design can significantly impact sustainability outcomes, for example, accessibility, urban form, land-use, heritage, health and wellbeing. Good planning and design can lead to improved economic and social benefits.

The operation of infrastructure has ongoing impacts – particularly as they relate to energy use, and emissions, runoff, noise, light, ecological impacts, safety etc.

Operations can provide ongoing employment and economic benefit.

The construction of infrastructure impacts on material use, energy, water, waste, etc. Construction can provide employment, with potential to target 'social' procurement.

Natural resources for roading projects are still currently available in good quality and at reasonable costs. Council currently does not have specific policy requiring the reuse of removed materials.

A negative impact of ongoing renewals is the drawdown of the resource which is either quarried or from river run sources. Each of these areas both require resource consents and their future sustainability will be monitored.

Remetalling of unsealed roads is one area where wise use of resources needs to be considered and monitored. The type of materials utilised is also key to the impacts on sustainability.

6.1.1 Social and Cultural

Accessibility and safety are key aspects contributing to sustainability in this area. The ILM process and associated strategic responses are intended to address concerns and improve performance of the transport system in this respect.

Roading, as part of the community, will encourage the following to improve safety:

- Encourage a mode shift toward Active Transport i.e. passenger transport, walking and cycling
- Promote the shift to electric vehicles
- Encourage the community to manage road risk and utilise safer vehicles
- Promote behaviour change to driving attitudes in Invercargill

6.1.2 Environmental

Roading seeks to reduce consumption of resources and the effects of development on the environment. Relevant aspects of sustainable design will be considered and where appropriate incorporated into projects, including but not exclusive to:

- Minimise materials and waste during construction, particularly those based on oil or derivatives.
- Adopt processes to minimise dust generation from unsealed roads.
- Sustainable materials used in construction and reuse where appropriate.
- Encourage and promote use of electric vehicles.
- Climate Change Adaption
- Carbon emissions at project and network level
- Minimise impacts of stormwater runoff and disposal.
- Resilience for communities to climate change impacts.

The environmental challenges of managing stormwater run-off are seen as an escalating challenge.

Freshwater Plans from the Regional Council will seek to better manage what comes off the road surface and this could introduce additional costs if this is required to be treated. Currently the detritus collected from the streets and stormwater runoff from sumps is expensive to dispose of to landfills and this is becoming a greater cost and concern.

Dust from gravel roads is more concerning for residents as it enters water supplies and this leads to unsustainable expectations and desire for roads to be sealed.

There are known areas where industrial and landfill contamination has occurred which is impacting the roading network. We are investing to understand more about these issues and develop appropriate responses.

6.1.3 Climate Change

Responding to the impacts of climate change is critical now as they become more apparent and intensify. A proactive approach now is necessary to ensure that wherever possible asset improvement projects and renewals that create or replace long-life assets such as bridges, structures, pavements and drainage, consider the long-term trends associated with climate change. Designs should allow for elemental sea level rise or storm and flood intensification to related hazards such as rainfall and wind damages wherever possible and practicable.

6.1.4 Economic and Financial

Roading as a significant infrastructural asset looks to provide the desired level of service in the most cost effective manner through the management of assets for present and future customers. The changing demographics of the community will mean that the ability to pay for some will change, so having robust and appropriate activity management in place is essential for Invercargill to remain sustainable. All asset groups will have to work together and act cohesively to ensure success.

We do this by:

- Maintain our current asset base

- Recognising the consumption of assets and appropriately funding it, at the right time using the right techniques.
- Focus on asset criticality, plan and invest for resilience
- Categorising capital versus operational expenditure and understanding how each influences the community.
- Undertaking projects which are affordable and can be justified using a Better Business Case approach, i.e. evidence bases activity investment.
- Allocating costs and preparing forecasts over the long-term (30 years or more). Ensuring a whole of life approach is used for assets.
- When arranging contracts or significant activities, consider how investment decisions may impact a viable competitive supplier market in the region
- Reporting on financial performance.
- Better understand and meet our community's needs, through consultation and delivery of agreed levels of service
- Strengthen our asset management processes, tools, data and expertise

6.1.6 Summary of Sustainability Challenges and Issues

Key Issues:

- Manage and respond to the impacts of climate change.
- Encourage the community to manage road risk.
- Promote behaviour change to driving attitudes in Invercargill.
- Adopt processes to minimise dust generation from unsealed roads.
- Minimise impacts of stormwater runoff and disposal.
- Undertake projects at the right time using a Better Business Case approach.

Key Challenges:

- Encourage a mode shift to passenger transport, walking and cycling.
- Encourage the community to manage road risk and utilise safer vehicles.
- Enable community resilience after natural hazard events
- Design for adaption and resilience to hazards including climate change.
- Recognising the consumption of assets and appropriately funding it, at the right time.
- Procuring resources considering market sustainability utilising best practice contract smart buyer processes.

6.2 RISK

Council is committed to acting in a manner that enables it to reliably achieve objectives, address uncertainty, and act with integrity.

To support these outcomes Council is developing an approach which provides integrated governance management and assurance of performance, risk and compliance.

The approach taken by Council is set out in the Risk Management Framework – Policy and Process.

Council manages the strategic risks associated with the assumptions identified in the preparation of the Long-term Plan.

Council also manages a range of other risks, including Health and Safety. These risks are managed through its risk management register as contained in **Process Manager.**

6.2.3 Critical Assets Decision-Making

Defining asset criticality is important as it draws attention to those assets which are the most important, irrespective of the likelihood of failure of the asset. Critical assets typically require more proactive management to minimise or eliminate this risk.

The likelihood of failure of an asset is often difficult to assess, however condition and age are parameters that provide an indication. The worse the condition of the asset, the more likely it is to fail.

Assets which are both extremely critical and more likely to fail should have higher priority and be replaced or rehabilitated earlier in their lifecycle than others, and at lower levels "run to failure" may be perfectly acceptable.

Refer to Section 7.1 which further describes the use of these principles in decision-making.

6.2.4 Risk Identification and Assessment

The detailed risk analysis utilises the corporate framework.

The following is a summary of the high risks.

Table 6.1 High Risk Identification and Assessment

Asset Area	Risk description	Severity
Pavements	Unsafe roads due to ice or spilled materials	High
Pavements	Unsafe roads due to insufficient or poorly timed interventions	High
Pavements	Unsafe roads due to weather or flood conditions	High
Pavements	Unsafe roads due to underfunded maintenance and renewal programmes	High
Surfacing	Cost escalations due to oil price increases and inflation	High
Traffic Systems	Unsafe roads due to vandalised safety signs	High
Traffic Systems	Unsafe intersections due to failed traffic signals	High
Drainage	Unsafe roads due to sump grates being removed	High
Corporate	Loss of knowledge and asset expertise or legislative change	High
External Influences (Natural disaster, climate change and vandalism)	Unsafe roads, bridge damage or landfill environmental issues due to external influences e.g. flooding, earthquake or vandalism	High

The primary risk identified through the risk analysis is the need to be able to respond to climatic conditions such as ice and flooding, and interventions through maintenance.

Bridges whilst important to other utilities also have importance in the risk profile as they link key and strategic assets such as the hospital and airport. Damage to the bridge stock is likely to have an impact on all bridges from events such as distant large earthquakes or significant flooding.

Liquefaction following earthquakes could impact the accessibility of the City as large parts are on land recognised as being susceptible to liquefaction.

6.2.5 Summary of Key Risk Issues

Key risks are:

- Bridge damage due to earthquake or flooding.
- Unsafe roads due to external actions such as vandalism or climatic conditions.
- Unsafe roads due to underfunding maintenance and renewals and not responding.
- Legislative change or loss of corporate knowledge.
- Historic landfills creating significant environmental issues

6.2.6 Possible Approaches to Risk Mitigation

Table 6.2 Approaches to Risk Mitigation

Risk Caused By	Current Practice	Recommended Actions
Bridge damage due to earthquake or flooding	Seismic investigation and assessments. Expert detailed inspections regime.	**Structural improvement or route diversion plans. Monitor flood warning and protect if necessary.**

Unsafe roads due to external actions such as vandalism or climatic	Inspections by contractors on regular basis. Respond to RFS request.	**Maintain effective contractors and systems. Look to assets which mitigate issues.**
Unsafe roads due to underfunding maintenance and renewals and not responding	Publicly tender projects for cost effective programmes. Have informed governance. Identify works and reporting.	**More information to Council. Detailed programmes, well modelled and monitored.**
Legislative change or loss of corporate knowledge	Have data systems and plans appropriately prepared. Have awareness of legal changes.	**Value staff knowledge. Engage skilled contractors and consultants. Have input into legal change.**
Historic landfills creating significant environmental issues	**Project working group working on interim and long term solutions**	**Implement remedial action plan** **Follow land use consent requirements**

A risk management approach alone is not sufficient and needs to be complemented by a resilience approach that considers significant events that may be unlikely but where failure of assets and widespread loss of service may be inevitable.

6.3 RESILIENCE

6.3.1 Resilience Definition

The working definition of resilience to Invercargill City Council is the ability of the organisation to survive a crisis and thrive in a world of uncertainty. Resilience includes both planned risk management (Section 6.2) and adaptive capacity. In this latter context, resilience refers to our capacity to adapt, rather than preparedness or recovery, which is the capacity of people, the community and systems to adapt in the face of unpredictable change, such as the 'unknown unknowns'.

A wider definition of *Resilience** developed through the 100 Resilient Cities global initiative has four dimensions and three drivers within each:

- **Health and Wellbeing**
  - Meet basic needs
  - Support livelihoods and employment
  - Ensure public health services

- **Economy and Society**
  - Foster economic prosperity
  - Ensure social stability, security and justice
  - Promote cohesive and engaged communities

- **Infrastructure and Environment**
  - Provide reliable communication and mobility
  - Ensure continuity of critical services
  - Provide and enhance natural and man-made assets

- **Leadership and Strategy**
  - Promote leadership and effective management
  - Empower a broad range of stakeholders
  - Foster long-term and integrated planning

* http://www.100resilientcities.org/resilience

These attributes provide a useful list for considering the effectiveness of strategies and activities in creating a more resilient city.

6.3.2 Business Continuity and Emergency Response Arrangements

Emergency Management Southland (EMS) is a shared service with other Southland Councils that delivers a structured approach to civil defence emergency management (CDEM) as required by legislation. Each Council is responsible to provide trained staff into the team when requested and therefore enabling it to have a wider resource base when necessary. A specifically designed venue has been setup for the operation at Price Street for all the Councils that has three to four full time CDEM staff coordinating the response.

Basic continuity planning has been initiated at Invercargill City Council but further development is required to establish a robust and reliable set of response processes. Staff have a good understanding but the processes need to be documented. These are needed to be able to respond and manage Council assets in a sustainable manner in the event of a significant event where potentially all of Southland is affected. Staff have the knowledge, and have participated in national training exercises and understand what is needed.

Further robust documentation of process is needed for the future. Basic plans are in place with an agreed establishment process, alternative base location and allocated positions but greater detail is needed.

Invercargill has also had a lifelines plan in place for several years. This plan assesses the vulnerability of all lifeline utility infrastructure to natural hazards and identifies where asset strengthening or other reduction measures may be needed. This includes activities such as the seismic strengthening of bridges and structures. The Council continues to work at a Regional level to advance its planning provisions. These plans recognise the isolation that Invercargill could experience in a major event such as the South Island Alpine Fault (AF8) earthquake, an event that would affect and disrupt the whole South Island and parts of the North Island.

Invercargill also is reliant on the State Highways to connect and whilst travel may be possible across the City, most consumable goods (food, fuel, etc) are transported via the State Highway system from Christchurch or Dunedin.

6.3.3 Current and Desired Resilience Assessment

Resilience is a topic that we are learning more about from events such as the Christchurch, Kaikoura and Wellington earthquakes; and nelson, Auckland and Gisborne flood events. Invercargill City Council is seeking to make our organisation and infrastructure more resilient. Resilience will be part of the improvement process planned in 24-27.

No resilience assessment has yet been undertaken relating to roading. Some resilience consideration has been undertaken on part of the insurance portfolio.

6.3.4 Summary of Resilience Issues and Challenges

Key Messages – Risks and Resilience

- Further detailed business planning is needed to enable an effective Council response to emergency events that affect the City, the Southland region, or a more widespread area.
- Resources from EMS provide a Southland-wide response in the event of a civil defence emergency, and are able to support a City-led response if required.
- Southland is isolated and is susceptible to significant natural disaster events.
- Invercargill is reliant on the State Highway network to be operable for the supply of most basic commodities to the city.

6.4 NEGATIVE EFFECTS

There are a number of unavoidable consequences of the Road Network activity which need to be managed to ensure a sustainable service with minimal negative effects.

Negative effects that the activity may have on the social, economic, environmental or cultural wellbeing of the community include:

- The number (and cost) of people killed or injured on roads each year.
- Effects of poor quality roading assets and personal security when using City's roading network.
- Environmental degradation, delays and detours resulting from new construction, maintenance and utility works on the local road network.
- Impacts of major transport infrastructure projects on adjacent residents and environment such as excessive noise and vibration.
- Dust nuisance on unsealed roads and the quality of stormwater from roads that discharges into adjacent coastal or other waters.
- Hazardous material spills within the road corridor or transport facility.
- Health and safety risks associated with the construction, maintenance or operation of transportation infrastructure.
- The impact on public health from the reliance on cars.
- Impact on residents due to noise and other effects due to road classification and use.
- The economic cost to the community (or to the National or Regional economy) as a result of road congestion.
- The extent to which the roading network impacts on the quality of life of a particular community (or commercial area).
- Gaseous discharges from motor vehicles including greenhouse gases.
- The excessive use by heavy motor vehicles of all types, on local roads.

The following table shows how we monitor and manage these negative effects within Invercargill City's roading activities. No potential negative effects have been identified in relation to cultural wellbeing.

Table 6.3 Monitoring and Managing Negative Effects

Negative Effects	Effects on …	How we Monitor and Respond to these Effects
Road deaths and injuries	Social Economic	Monitor**: Annual reports on crash statistics for Invercargill City.** Response**:** ➢ **Maintain a road safety strategy and a road safety action plan.**

		➢ **Prepare a low cost low risk projects plan each year.** ➢ **Prepare renewals plans and maintenance plans to address potentially unsafe road surfaces (especially blackspots).** ➢ **Manage a risk conversation with the community and manage appropriate speed limits.** ➢ **Work closely with Waka Kotahi, the New Zealand Police and Road Safety Southland.**
Effects of poor quality roading assets and personal security when using City's roading network	Social Environment	Monitor: **Survey of user satisfaction / perception of safety for infrastructure under direct Council control (e.g. footpath condition, road surface condition).** Response: **Develop guidelines to manage the level of service (e.g. footpath upgrade policy), targeted level of service improvements (e.g. better lighting works, safety audits).**
Environmental degradation, delays and detours resulting from new construction, maintenance and utility works on the local road network	Social Economic	Monitor**: Complaints and call-centre queries.** Response**: Require approved traffic management plan for construction works, ongoing liaison with key utility operators.**
Impacts of major transport infrastructure projects on adjacent residents and environment such as excessive noise and vibration.	Social Economic Environment	Monitor: **Survey of residents / businesses about the impact of major infrastructure under direct Council control.** Response**:** ➢ **Install noise barriers where appropriate.** ➢ **Set appropriate speed limits.** ➢ **Use appropriate surfacing on busy roads in residential areas.** ➢ **Manage contracts to minimise effects.**
Dust nuisance on unsealed roads and contamination of waterways by storm water discharged from road surfaces	Social Environment	Monitor: **Use dust traps to measure dust generation in sensitive areas.** Response: ➢ **Ensure proper attention is paid to water run-off / sediment control management when carrying out work on the roads.** ➢ **Manage roadside drains.** ➢ **Clean sumps regularly.** ➢ **Use innovative products to reduce dust generation in other areas.**

		➢ **Develop policy for decision making.** ➢ **Allow user funded actions.** ➢ **Improve communication at subdivision consenting.**
Hazardous material spills within the road corridor or transport facility	Environment	Monitor**: Notification of spill by call centre from Customer Contact or Emergency Services.** Response**: As set out in Emergency Response Maintenance Contractor is required to make safe within one hour of notification.**
Cost escalations due to oil prices increases and inflation rates	Social Economic Environment	Monitor**: NZTA monthly release of bitumen price indices.** Response**: Seek additional funding to maintain work programme, or reduce work programme to meet existing budget. Manage timing of works.**
Health and safety risks associated with the construction, maintenance or operation of transportation infrastructure	Social Economic	Monitor**: Complaints and call centre queries.** Response**: Improve safety of the roading network to reduce the occurrence of crashes.**
The impact on public health from the reliance on cars.	Social Economic	Response**: Promote the active transport modes such as walking and cycling. Investigate future demand for public transport services and infrastructure.**
Impact on residents due to noise and other effects due to road classification and use.	Social Economic	Monitor**: Survey and traffic count roads to ensure traffic use is appropriate to the classification.** Response**:** ➢ **High priority roads have expectation of greater numbers of vehicles including heavy vehicles which is appropriate to the function of the road.** ➢ **Use Bylaws to control use.** ➢ **Develop traffic calming strategies to direct traffic.**
The economic cost to the community (or to the National or Regional economy) as a result of road congestion	Economic	Monitor**: Survey travel times and traffic count roads to assess potential congestion impacts.** Response**:** ➢ **Investment in new capacity or demand management where appropriate.**
The extent to which the roading network impacts on the	Social	Monitor**: Quality of life surveys with focus on impacts of traffic on living environments.**

quality of life of a particular community (or commercial area)		Response**:** ➢ **Traffic management plans and controls.** ➢ **Network Operating Framework.**
Gaseous discharges from motor vehicles including greenhouse gases	Environment	Monitor**: Quality of air in developed areas, greenhouse gas emissions (fuel use proxy?)** Response**:** ➢ **Encourage uptake of modern environmentally friendly vehicles.** ➢ **Encourage more use of active and public transport modes..**
The excessive use by heavy motor vehicles of all types, on local roads	**Social**	Monitor**: Heavy vehicle traffic counts to ensure traffic use is appropriate to the classification.** Response**:** ➢ **"De-tune" local roads to discourage through use by heavy vehicles.** ➢ **Develop freight hierarchy.**

Particular issues which may become more problematic over the next 10 years involve road construction and upgrading works, and in particular:

- The use of recycled materials for pavements should be investigated to reduce the overall waste from maintenance and construction activities on the network.
- Unavailability of appropriate gravel aggregate from water courses.
- Light spill from street lights.
- Congestion (real or perceived) of traffic leading to alternative travel paths desirable to drivers but not residents on the streets affected.
- Request for use of dust suppressing on unsealed roads may be environmentally acceptable, where products may be unproven.
- More truck movements on roads previously not used but with an appropriate "functional" classification. Residents may be dissatisfied but the road function may be appropriate.
- Further environmental difficulties and needs to better manage the capture, treatment and disposal of surface detritus and sump cleaning due to by-products deposited on roads.

Key high-level actions related to the operation of the roading network which can significantly reduce the impacts of these negative effects include:

- Promote active transport modes such as passenger transport, walking and cycling that reduce vehicle emissions and improve the health of the Community.
- Investigate the future demand for public transport services and infrastructure.
- Improve the safety of the roading network for all road users to reduce the occurrence of crashes.
- Improve the roading network to provide a reliable and efficient network for the movement of people and freight.

7. Managing Our Activities (Programme Business Case)

7.1 RESPONDING TO THE ISSUES AND CHALLENGES

7.1.1 Strategic Responses

The key problem areas in the **Strategic Case** relate to:

- Behaviour, user choices and network layout is resulting in fatal and serious injuries
- The historical design and changing land use has led to modal conflict, limited accessibility and not meeting expectations.

The key **Strategic Benefits** to resolving these problem areas are:

- Continuous improvement of road user safety
- Improved community connectivity and social wellbeing
- Contribute to economic growth and productivity

The **Strategic Responses** required can be summarised as:

- Work together to tell a more effective story with the community, partners and stakeholders
- Ensure streets and roads are delivering the right outcomes for users to feel safe in their use
- Ensure that the land usage and the network work effectively together.

7.1.2 Investment Areas

The roading activity has two areas where investment occurs – subsidised and unsubsidised.

Subsidised Roading

Waka Kotahi is a co investor with Council through the Land Transport Programme and supports this investment with a Financial Assistance Rate (FAR) currently 51% this has reduced from 54% in 2020. Council contributes the remaining costs through rates, and other user pay areas.

Works included in this area relate to asset classes – pavements, drainage, traffic services (signs signals lighting, road marking), bridges and structures, some environmental costs (part of sweeping (30% is the subsidised portion), vegetation and pest plant control and mowing), and network management.

Within these activities, investment options are considered (where the level of investment is sufficient to be appropriate) to each asset class in this section (e.g. Pavements, Drainage, etc.).

Unsubsidised Roading

This area of the activity, the community funds 100% of the costs through rates or user charging such as permits or fees. Included in this area are works related to some street features such as seating, sweeping of roads and inner-city footpaths, mowing (other than as above), security cameras, under veranda lighting and amenity maintenance.

7.1.3 Investment Approach

The following approaches are available to Council in developing the overall programme. These include:

- Do minimum
- Integrated Planning
- Demand Management
- Best use of existing system
- New infrastructure

Strategic Case Optioneering

A simple multi criteria analysis (MCA) was carried out for each problem statement to rank these approaches. The following criteria were weighted and assessed in this process in relation to how well each approach:

- Aligns with GPS goals
- Aligns with RLTP goals
- Addresses the problem statements
- Realises the investment benefits
- Aligns with community outcomes
- Delivers customer outcomes (CLoS)
- Delivers performance benefits
- Delivers environmental benefits
- Delivers social and cultural benefits
- Compares based on relative costs

Scale of Impact

Impact	Score
Significantly Positive	3
Moderately Positive	2
Slightly Positive	1
Neutral	0
Slightly Negative	-1
Moderately Negative	-2
Significantly Negative	-3

The output from this process helps provide direction to the Programme Case, signalling the preferred strategic approaches to addressing the problems across different asset classes and activities.

Strategic preferences showing the ranked priority from this process are summarised in the table below.

Table 7.1

Problem	Benefit	Possible Strategic Approaches				
		Do Minimum	**Integrated Planning**	**Demand Management**	**Best use of existing system**	**New Infrastructure**
Behaviour, user choices and network layout is resulting in fatal and serious injuries	Continuous improvement of road user safety	5th	1st	2nd	3rd	4th
	Improved community connectivity and social wellbeing	5th	1st	2nd	4th	3rd
The historical design and changing land use has led to modal conflict, limited accessibility and not meeting expectations.	Contribute to economic growth and productivity	NA	1st	2nd	3rd	4th

Note that the GPS addresses, consideration was given to these in the assessment:

- Alignment – does investment align with the strategic direction of the GPS?
- Effectiveness – to what extent does the proposal achieve the priorities of the GPS?
- Efficiency – is this being achieved at the best cost for the results being delivered?

Multi-criteria analysis 1

Project name:	Invercargill City Council	**Problem/opportunity statement:**	Problem: Behavior, user choice and network layout is resulting in fatal and serious injuries Benefit: Continous Improvement of road user safety
Do-minimum:	Ensure asset failure does not present a safety concern, accept higher failure likelihood more failures on low volume road and worse condition accepted on busier roads		

	Do-minimum	Intervention types sourced from the intervention hierarchy (to be added or deleted as necessary)			
		Integrated planning	**Manage demand**	**Best use of existing system**	**New infrastructure**
		A range of approaches are avilable, including: Safety Investigations and Audits Speed Management and Limits Review Differencial Levels of Service Develop a community engagement strategy and plan Develop a collaborative relationship plan	Stronger emphasis on safety education programmes Influencing driver behaviour and road user awareness	Resurfacing programme - focus on skid resistence and roughness Life Cycle Cost Outcomes Invest in use and improvement of data collection and analysis	Safety initiiatives - maintain clear visibility, new traffic facilities, change intersection controls, improve lighting Stong focus on Low Cost Low Risk Programme Life Cycle Cost Outcomes
Critical success factors: investment objectives					
Reduced number of Deaths and Serious Injuries occuring	-3	3	2	0	3
Increased use of road safety education	-3	1	3	0	0
Maintain or improve network condition and performance	-3	0	0	3	3
Other critical success factors					
Potential achievability	3	3	2	3	3
Safety and design	-3	3	1	2	3
Potential affordability	1	3	3	2	-1
Potential value for money	-2	3	1	2	2
Supplier capacity and capability	0	2	2	3	1
Scheduling/programming	0	-1	1	1	0
Opportunities and impacts (insert N/A if not relevant)					
Environmental effects	-1	1	0	1	-1
Social and cultural impacts	-2	3	3	0	3
Climate change mitigation	-1	1	0	1	-1
Climate change adaptation	0	0	0	0	1
Impacts on te ao Māori	-1	0	1	0	1
Property impacts	0	0	0	0	0
Property acquisition	0	0	0	0	-1
Impact on properties	0	0	0	0	0
Project-specific impacts	-15	22	19	18	16

Multi-criteria analysis 2

Project name:	Invercargill City Council	**Problem/opportunity statement:**	Problem: Behavior, user choice and network layout is resulting in fatal and serious injuries and Historical design and changing land use has led to modal conflict, limited accessibility and not meetong expectations Benefit: Improved community connectivity and social wellbeing
Do-minimum:	Ensure asset failure does not present a safety concern, accept higher failure likelihood more failures on low volume road and worse condition accepted on busier roads		

	Intervention types sourced from the intervention hierarchy (to be added or deleted as necessary)			
	Integrated planning	**Manage demand**	**Best use of existing system**	**New infrastructure**
Do-minimum	A range of approaches are avilable, including: Safety Investigations and Audits Speed Management and Limits Review Develop a community engagement strategy and plan Develop a collaborative relationship plan Develop a Network Operating Strategy Climate Adaption Strategy and Plan Emergency Response / Lifelines Plans	Stronger emphasis on safety education programmes Influencing driver behaviour and road user awareness Develop a Network Operating Framework Community expectations, if a reduced LoS was proposed Contract Emergency Response Arrangements	Improve road environment and safe run-off Resurfacing programme - focus on skid resistence and roughness Life Cycle Cost Outcomes Differencial Levels of Service Alternative Transport Modes - Rail etc.	Safety initiatives - maintain clear visibility, new traffic facilities, change intersection controls, improve lighting Stong focus on Low Cost Low Risk Programme Life Cycle Cost Outcomes Costal, geotechnical protection Invest in new Technologies
Critical success factors: investment objectives				
Increase in multimodal access to key destinations	-2	3	3	1	3
Reduction in network carbon emissons	-2	3	0	1	-1
Climate Adaption and Community Resilience	-1	3	3	1	1
Maintain or improve network condition and performance	-3	1	1	2	3
Users feel safe in the road network	-1	3	3	1	3
Other critical success factors					
Potential achievability	3	2	2	3	3
Technical	3	1	2	3	3
Safety and design	-2	3	3	1	3
Consentability	0	0	0	0	-1
Potential affordability	-2	1	1	-1	-2
Potential value for money	-3	2	2	1	3
Supplier capacity and capability	1	1	1	1	1
Scheduling/programming	-1	1	1	3	2
Opportunities and impacts (insert N/A if not relevant)					
Environmental effects	-3	3	0	1	0
Social and cultural impacts	-2	3	3	1	3
Climate change mitigation	-1	3	2	2	3
Climate change adaptation	-1	3	0	0	1
Cumulative impacts	0	1	2	1	0
Impacts on te ao Māori	0	1	1	0	0
Property impacts					
Property acquisition	0	0	0	0	0
Impact on properties	0	0	0	0	0
Project-specific impacts	-17	38	30	22	28

Multi-criteria analysis 3

Project name:	Invercargill City Council	**Problem/opportunity statement:**	Problem: Historical design and changing land use has led to modal conflict, limited accessibility and not meetong expectations Benefit: Crontribute to Economic Growth and Productivity
Do-minimum:	N/A		

		Intervention types sourced from the intervention hierarchy (to be added or deleted as necessary)			
	Do-minimum	**Integrated planning**	**Manage demand**	**Best use of existing system**	**New infrastructure**
		A range of approaches are avilable, including: Safety Investigations and Audits Speed Management and Limits Review Develop a community engagement strategy and plan Develop a collaborative relationship plan Develop a Network Operating Strategy - HCV Planning Emergency Response / Lifelines Plans Proactive in managing impacts of developments	Influencing driver behaviour and road user awareness Stronger emphasis on safety education programmes Influencing driver behaviour and road user awarenes Develop a Network Operating Framework Better Management of HCVs Travel Demand Management - Behavior Programmes	Differencial Levels of Service Alternative Transport Modes - Rail etc. Improve Active Transport and Passenger Transport LoS	Safety initiatives - maintain clear visibility, new traffic facilities, change intersection controls, improve lighting Stong focus on Low Cost Low Risk Programme Active Mode Separations Programmes Invest in new Technologies Invest in more passenger transport vehicles
Critical success factors: investment objectives					
Increased freight through put		2	2	0	1
Percentage of network available to mode of use		2	1	2	3
Land Use and Transport Network don't Conflict		3	0	1	0
Other critical success factors					
Potential achievability		1	2	1	1
Technical		0	-1	-1	1
Safety and design		2	3	2	3
Consentability		0	0	0	0
Potential affordability		1	1	2	-2
Potential value for money		3	3	1	1
Supplier capacity and capability		1	1	1	-2
Scheduling/programming		1	1	1	1
Opportunities and impacts (insert N/A if not relevant)					
Environmental effects		2	2	3	3
Social and cultural impacts		2	2	2	3
Climate change mitigation		2	0	3	3
Climate change adaptation		1	0	2	3
Cumulative impacts		0	0	0	0
Impacts on te ao Māori		1	1	1	1
Property impacts					
Property acquisition		0	0	0	0
Impact on properties		1	0	0	0
Project-specific impacts		25	18	21	20

The Multi Criteria Analysis above clearly concludes that Integrated Transport Management Planning and Demand Management will be the most effective co-investment to either subsidise or non-subsidised activities. Waka Kotahi NZ Transport Agency co invests with councils and they have a national approach which outlines the process and outcomes (e.g. business case approach, IAF, etc) where they are willing and able to participate in projects and activities.

7.1.4 Programme Case Evaluation

Optioneering Approach

This process is aligned with the current Te Ringa Maimoa approach for assessing problems and ranking options using a multi-criteria analysis approach. Note that Waka Kotahi NZ Transport Agency has its own Investment Assessment Framework which they will utilise on a programme level (rather than asset) to determine their level of investment. Furthermore, all subsidised activities need to comply with the Transport Agency's procedural and monitoring requirements.

The Programme Business Case process develops and recommends programmes to operate, maintain, renew, and ultimately dispose of transport assets whilst delivering service to transport users and the Invercargill community.

An important aspect is the selection of optimised investment levels for renewal. Sealed road pavements have the largest impact on the overall investment level, and there is significant variability across different investment levels. Hence, significant analysis effort is focused on Pavements in this AMP.

The optioneering process adopted is as follows:

- Where appropriate to the scale and complexity of an asset or activity class, identify possible options for formulating the programme. These should, as a minimum, consider the balance between service levels, risk, and investment levels.
  - Note that different options may involve smaller or greater budgets that achieve different investment objectives – for example, a minimal programme which accepts increased risk or higher long-term costs.
  - Where the asset class or activity is minor and / or there is little discretion in the funding request, optioneering has not been carried out.

- Using a multi-criteria analysis (MCA) approach, evaluate and rank each possible option against the following criteria:
  - Contribution to community outcomes and / or strategic objectives.
  - Effectiveness in addressing ICC problem statements and achieving investment benefits
  - Impact on road safety outcomes
  - Impact on levels of service including ONRC related
  - Impact on risk, e.g. asset failure, reputational risk
  - Impact on asset preservation and "whole of life" cost outcomes
  - Community affordability
  - Environmental impacts

Scale of Impact

Impact	Score
Significantly Positive	3
Moderately Positive	2
Slightly Positive	1
Neutral	0
Slightly Negative	-1
Moderately Negative	-2
Significantly Negative	-3

- Determine the most appropriate mix of options and develop the recommended programme optimised in terms of levels of service, asset criticality, risk, and which respond to the challenges. These are the "AMP optimised" programmes that offer best alignment with the strategic objectives.

Risk-based Optimisation

A further enhancement in the evaluation process is "risk-based" optimisation, drilling down further into risk impacts. Likelihood and impact of potential asset failure can be expressed in financial terms, so that Council and Waka Kotahi NZ Transport Agency (as co investment funder) can consider acceptable risk tolerance levels. This is an important role for decision-makers, as it drives intervention levels for asset management.

The key question is ***how much risk are the parties willing to accept*?**

The likelihood of failure of an asset can be difficult to assess, however condition and age are parameters that provide an initial indication. The worse the condition of the asset, the more likely it is to fail. Using the replacement cost valuation of the asset and available condition data, an assessment can be made of the distribution of replacement cost against both criticality (and importance) and condition, as shown below.

This table provides a "risk exposure" view, given the assumption that an asset in 'poor' condition is more likely to fail than one in a 'good' condition. Assets which are both very important and more likely to fail should have a higher priority and be replaced or rehabilitated earlier in their lifecycle than others, and those assets at lower levels, a "run to failure" strategy may be perfectly acceptable.

Where there is presently insufficient condition data to complete this table, it will be further developed as an improvement plan action. This will firstly focus on assets which are the most significant in terms of their financial value, and for which reliable condition data is available – in particular sealed pavements and structures.

Initially, this approach will be focused on ONRC categories.

Table 7.2

Importance Level (or Criticality)	Replacement Cost linked to Failure Likelihood				
	1 As New	2 Good	3 Average	4 Poor	5 Very Poor
	Very Rare	Rare	Seldom	Common	Frequent
Regional					
Arterial					
Primary Collector					
Secondary Collector					
Access / Low Volume					

7.2 LIFECYCLE ACTIVITIES

7.2.1 Operations and Maintenance Strategy

Asset Operations

Asset operations are activities that have no effect on asset condition but are necessary to keep the asset appropriately utilised.

This feature distinguishes them from maintenance activities, which directly affect asset condition and the life of the asset. Costs such as power supply to street lights and street cleaning are regarded as operations costs.

Maintenance

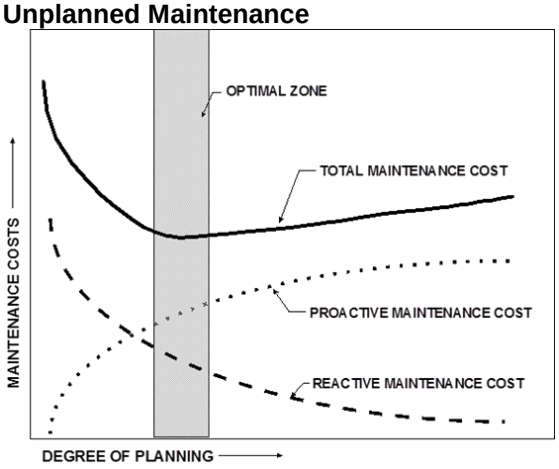
Maintenance activities are the day-to-day works needed to keep assets operating at the required service levels. These activities are often referred to as "routine maintenance". Routine maintenance falls into two broad categories as follows:

Planned (Proactive) Maintenance: Proactive inspection and maintenance works planned to delay or prevent asset failure. Also referred to as Preventative Maintenance.

Unplanned (Reactive) Maintenance: Action to correct asset malfunctions and failures on an as required basis after the failure has occurred (e.g. urgent repairs).

The Council's intention is that the most appropriate balance be found between planned and unplanned maintenance to help achieve the lowest lifecycle costs for its roading assets, as highlighted in the figure.

Figure 7.1 Balance between Planned and Unplanned Maintenance



The following table details the primary types of maintenance carried out for the main asset categories.

Table 7.3 Primary Types of Maintenance Carried Out on Main Assets

Asset Category		Type of Maintenance
Roads	Road Carriageway (Pavements / Surfaces)	**Preventative and Reactive**
	Footpaths	**Preventative and Reactive**
Structures	Bridges, Retaining / Protection Structures	**Preventative**
Drainage	Culverts	**Preventative**
	Kerb and Channel	**Preventative and Reactive**
	Open Drains	**Preventative**
Safety Facilities	Road Markings	**Preventative**
	Guard-rails, sight rails, etc	**Preventative and Reactive**
	Street lights	**Reactive**
Furniture	**Bollards, Tree Grills, Seating, Rubbish Bins**	**Reactive**

7.2.2 Operations and Maintenance Standards and Specifications

Best practice is that works undertaken on the network must follow the specifications and guidelines established by Waka Kotahi which is appropriate for local government roading. Some Waka Kotahi specifications have been developed for State Highways and may not always be suitable for direct use.

Specifications for corridor maintenance and renewal works are strongly based on nationally agreed specifications such as those set out in 3.2.3 Industry Standards and Guidelines. These specifications include B, M and P series (historically known as TNZ Specifications) together with those included in the contracts.

Conditions of Contract are based around NZS 3910 and 3917.

Industry based specifications are utilised where possible to ensure that consistency as much as is possible is offered to the contracting industry through well communicated procurement strategies such that value for money is obtained.

7.2.3 Renewal Strategy

Renewals are significant works that do not increase an asset's original design capacity or improve its original condition.

Work over and above restoring an asset to original capacity and condition is new work.

This said, when the capacity of an asset is increased during a renewal it is legitimate to treat only the incremental cost of the increased capacity as asset improvement / new work.

A renewal may involve complete replacement of an asset or replacement of all or some major components.

Renewals are distinct from routine maintenance activities. Routine maintenance is an on-going task occurring from day to day and is necessary to repair wear and tear and keep an asset operating safely. Renewal works are periodic and often both expensive and extensive; they restore the service potential of the asset consumed by normal use.

Asset renewal is undertaken when an asset, or a significant component of an asset, has reached the end of its economic life.

Renewals are normally considered at the level to which components are split for valuation purposes.

Work that restores the structural integrity of components, e.g. repair of concrete spalling on a bridge, is therefore a maintenance activity and an owning and operating cost as defined by PBE IPSAS 17[27].

Renewal work therefore includes:

- Renewal and rehabilitation of existing assets to their original size and capacity that does not necessarily increase, but maintains, the level of service provided by the assets;
- Replacement of an entire component of an asset with a new one of equivalent size, capacity or a modern engineering equivalent of obsolete or obsolescent technology; and
- Replacement component of a new work that increases the capacity of an asset; i.e. that portion of an upgrading work that restores the asset to its original size and capacity, and no more.

Examples of renewals include:

[27] NZ Public Benefit Entity International Public Sector Accounting Standard 17 Property, Plant and Equipment

- Resurfacing of sealed and unsealed carriageways.
- Over-laying existing pavements with a new structural layer.
- Extensive excavation of existing structural layers and their replacement with new material.
- Replacement of kerb and channel, footpaths, streetlights, etc. at the end of their useful lives.

Renewals expenditure levels are set and adjusted on the following basis:

- The age profile of roading and footpath assets.
- The condition profile of the assets.
- Ongoing maintenance requirements and costs.
- The life expectancies of individual asset components.
- The levels of service being delivered by the assets, in comparison to those expected and required.
- The willingness of the Waka Kotahi to meet its share of the costs.
- The ability of the Council to fund the balance of costs after the Waka Kotahi contribution is considered.

Failure to maintain an adequate cyclic asset replacement programme will result in a decline in the overall standard and performance of the asset or asset components.

This generally leads to increasing costs of ownership and use, unless the component is abandoned and withdrawn from service, which is rarely practical or possible.

The Council employs a number of techniques to assist it in establishing the most appropriate time in an asset's life for renewal to occur. These techniques include:

- Deterioration modelling
- Benefit:cost analysis
- Net Present Value analysis
- Financial modelling
- End of life projection
- Demographics and land use analysis
- Comprehensive options analyses using this information, which is summarised in "business cases" that support funding requests to Waka Kotahi

7.2.4 Renewal Criteria / Intervention Standards

The general renewal strategy is to rehabilitate or replace assets when justified by:

- **Asset Performance** – An asset is renewed when it fails to meet the required level of service. Non-performing assets are identified by the monitoring of asset reliability, capacity and efficiency during maintenance and operational activity. Indicators of non-performing assets include:

  - Repeated asset failure.
  - Ineffective and / or uneconomic operations.
  - Inefficient energy consumption.

- **Economics** (value for money and at the right time) – An asset is renewed when it can no longer be economically repaired (i.e. the annual cost of repairs exceeds the annualised cost of its renewal). Council will actively research the effectiveness of new technology which may improve the overall performance of the assets. Renewing using smart buyer techniques.

- **Criticality / Risk / Condition** – An asset is renewed when the risk of failure has increased to the point that the environmental, public health, financial and social impacts are no longer acceptable to the community. Critical assets will be replaced before failure is imminent.

Planned and reactive replacement works are prioritised in accordance with the following priority ranking table and then programmed or, in urgent cases, undertaken immediately.

Table 7.4 Priority Ranking Table for Planned and Reactive Replacement Works

Priority	Description
1 (High)	**Asset failure has occurred and renewal is the most cost-effective treatment.** **Asset failure is imminent and failure is likely to have major impact on the environment, public health or property.** **Asset performance is non-compliant with community requirements.**
2	**Asset failure is imminent, but failure is likely to have only a minor impact on the environment, public health or property.** **Asset failure is imminent or likely and proactive renovation is justified economically.** **Associated work scheduled for the current financial year.** **Asset renewal is justified on the basis of minimal life cycle costs and deferment would result in significant additional costs.**
3 (Low)	**Asset failure is imminent but failure is likely to have a negligible impact on the environment, public health of property.** **Asset renewal is justified on the basis of minimal life cycle costs but deferment would result in minimal additional costs.**

Programmes are developed in each asset area and prioritised to establish the annual programmes which are submitted to Council for their consideration and approval.

7.2.5 Asset Development Strategy

Demand for new or upgraded facilities arises from the needs of the existing population, i.e. meeting level of service standards, changing habits and population growth. This demand can manifest itself in the need for:

- New roads
- Sealing of unsealed roads
- Widening and alignment improvements
- Upgraded intersections
- New or upgraded bridges
- New appropriate urban facilities, e.g. streetlights, kerb and channel, footpaths

The Council's asset creation strategy is generally:

- To prioritise work on the basis of need.
- To prioritise works where Waka Kotahi subsidy can be obtained above those works where there is no subsidy.
- To achieve networks of streets, rather than one-way access to properties, offering choices of routes to road users, avoiding concentration of traffic and providing alternative routes in emergencies.

- To fund its share of “Low Cost Low Risk” category to an “appropriate for network” standard.

Development of the road network is undertaken in accordance with the District Plan, which indicates priorities for road widening and new construction. Road designations included in the District Plan form a major commitment that, under the Resource Management Act, should be constructed within the period described in the Plan.

Asset Development Standards

The Council’s standards and specifications for the construction of assets will reflect the best current technologies, national standards and legislative requirements.

All new roading assets, constructed by the Council or acquired from subdivision developments, will be constructed in accordance with these standards, the latest version of the Invercargill City Council District Plan and the Council’s Bylaws and Policies including its standard engineering practices, Standards and Guidelines and relevant NZ Standards.

These in turn often reference other documents including those produced by Waka Kotahi and Austroads.

Capital Development Work Categories

No major development is planned within the Waka Kotahi subsidised budget areas other than through the Low Cost Low Risk category. Waka Kotahi work categories currently used for financial assistance are listed in the following table:

Table 7.5 NZTA’s Work Categories for Financial Assistance

Waka Kotahi Work Category	Key activity	Sub-activity	Comment
324	Road reconstruction	Full reconstruction	Programmed work
325	Seal extension	Sealing of unsealed roads	Programmed work
341	Low Cost Low Risk	Various	Capital works typically of a small scale targeted to safety improvements
357	Resilience improvements	Various – typically roads and bridges	No ICC projects at present

A range of potential projects are defined in Appendix 7, largely comprising intersection treatments, traffic signals and Local Area Traffic Management (LATM) devices.

7.2.6 Capital Development Selection Criteria

Development projects are prioritised according to need, with consideration being given to the following:

- The problems of the current site, geometry, layout, or structure in relation to public safety, measured in terms of the social cost of crashes
- The dependence on a particular structure or route; for example, a bridge on a no-exit road would generally have a higher priority that one on a road with an alternative route available
- The risks of future crashes at the site

- Requests made by the Council, its Committees, Community Boards and Advisory Groups
- Statutory obligations
- Maintenance and other cost savings
- Other benefits
- Affordability
- Lifelines security

Minor projects can usually be programmed as Resilience Improvements or Low Cost Low Risk, criteria for which are set by Waka Kotahi.

7.2.7 Asset Disposals

Assets are considered for disposal when:

- They become uneconomic to own or operate,
- They become surplus to current needs, or
- Through rationalisation of the asset stock. The most common reason for disposal is when part of a road or a junction has to be re-aligned and the disused part becomes surplus to requirements.

There is no forecasted disposal of assets other than as noted below:

Unformed Roads

Council has many unformed roads which are generally used by adjacent property owners. When disposal is requested or required and Council has no use for the land, it may state the required process included in the Local Government Act to stop the road and then dispose of it. These costs are met by the purchaser.

Carparking

There are no plans forecasted to withdraw and sell any of the existing off-street carparks.

Other Assets

Existing street features such as the columns in Dee Street as well as shelters, seats and similar assets may be removed as part of City Centre projects.

Forecast of Income / Expenditure from Asset Disposal

No forecasted costs or revenues are budgeted for disposals. Any costs associated with the disposal of features as noted above would be met by that project.

7.2.8 Programme Work Categories

The Council categorises its roading activities into two broad groups, subsidised and unsubsidised, based on the availability of NZTA financial assistance (subsidy), as listed in full in the following tables.

Table 7.6 Subsidised Roading Activities

Waka Kotahi Activity	Work Category	Work Category No.
Investment Management (including Transport Planning)	Activity Management Planning 2024-27 NLTP	**003**
	Programme Business Case Development	**004**
Road Maintenance (local roads)	Sealed Roads Pavement Maintenance	**111**
	Unsealed Pavement Maintenance	**112**
	Routine Drainage Maintenance	**113**
	Structures Maintenance	**114**
	Environmental Maintenance	**121**
	Network Services Maintenance	**122**
	Network Operations	**123**
	Cycle Path Maintenance	**124**
	Footpath Maintenance	**125**
	Level Crossing Warning Devices	**131**
	Minor Events	**140**
	Emergency Works	**141**
	Network & Asset Management	**151**
Road Maintenance (renewal and improvement of local roads)	Unsealed Road Metalling	**211**
	Sealed Road Resurfacing	**212**
	Drainage Renewals	**213**
	Sealed Road Pavement Rehabilitation	**214**
	Structures Component Replacements	**215**
	Bridges & Structures Renewals	**216**
	Environmental Renewals	**221**
	Network Services Renewals (incl street lighting)	**222**
	Cycle Path Renewals	**224**
	Footpath Renewals	**225**
Road Improvements (local roads)	New Traffic Management Facilities	**321**
	Replacement of Bridges and Structures[28]	**322**
	New Roads	**323**
	Road Improvements	**324**
	Seal Extension	**325**
	Property Purchase (local Roads)	**332**
	Advance Property Purchase	**333**
	Low Cost Low Risk	**341**
	Resilience Improvements	**357**
Road Safety	Safety promotion, education and advertising	**432**
Improvements	Low Cost Low Risk	**341**
Walking and Cycling Improvements	Travel Demand Management & Behaviour Change	**421**
	Walking Facilities	**451**
	Cycling Facilities	**452**

[28] Assumed to be where widening or improvement beyond like-for-like to modern engineering standards is proposed.

Public Transport Services	Passenger Services – Bus	**511**
	Total Mobility Operations	**517**
	Total Mobility Wheelchair and Hoists	**519**
	Payment of Total Mobility trips using a wheelchair hoist	**521**
	Public transport operations and management	**524**
	Operations and maintenance of real-time information and ticketing systems	**525**
	Public Transport Infrastructure Improvements & Major Renewals	**531**
	Low Cost Low Risk Public Transport Improvements	**532**
Public Transport Infrastructure	Public transport facilities and infrastructure – operations and maintenance	**514**
	Public transport facilities and infrastructure – renewals	**534**

Table 7.7 Unsubsidised Roading Activities

Unsubsidised Activity	Asset / Work Category
Maintenance; **Renewals; and** **New and improved infrastructure**	**Street Amenity Activity (unsubsidised sweeping, mowing and vegetation control)**
	Car Parking
	Under Veranda Lighting
	CCTV
	Street Features Assets (seating, litter bins, planting boxes, etc)
	Decorative and Feature Street Lighting *(where not covered in Category 221 as subsidised work)*

7.2.9 Alignment with Strategic Responses

The asset groups and activity classes in the following sections contribute to the various strategic responses identified in the Strategic Case. These linkages are shown in the following table.

Table 7.8 Linkage between Strategic Responses and Activity / Asset Classes

No.	STRATEGIC RESPONSES	Sealed Pavements	Unsealed Pavements	Structures	K&C and Drainage	Footpaths Cycleways	Network Services	Environmental Maintenance	Car Parking	Public Transport	Resilience Improvements	Low Cost Low Risk	Safety Promotion, etc	NAM / Planning, etc
	SAFETY													
S1	Improve safety management systems												√	√
S2	Develop and implement Safety Strategy	√	√	√	√	√	√	√	√	√		√	√	√
S3	Safety deficiencies targeted at problems (intersections & vulnerable users)	√	√	√	√	√	√	√				√		√
S4	Strengthen leadership in encouraging Active Transport Modes					√							√	√
S5	Manage speed in the community												√	√
S6	Develop a network wide approach to “sustainable streets”	√				√	√			√		√		√
S7	Strengthen education and communication projects												√	√
S8	Work with other community providers and strengthen community led initiatives	√	√	√	√	√	√	√					√	√
S9	General network inspections, safety audits, and crash reduction studies	√	√	√	√	√	√	√	√	√				√
S10	Fund and address asset defects which have a safety implication	√	√	√	√	√	√	√				√		√
S11	Implement specific improvements that have proven safety benefits												√	√
S12	Red-light camera strategy with NZTA													
S13	Support community initiatives relating to education and enforcement												√	√
	ASSET CONDITION AND PERFORMANCE													
CP1	Condition monitoring & inspection, address risk of critical asset failure	√	√	√	√	√	√	√	√	√				√
CP2	Know the assets and understand pressures and conflicts with community use	√	√	√	√	√	√	√	√	√				√
CP3	Optimise road maintenance and renewal activities	√	√	√	√	√								√
CP4	Review levels of service where under or over-delivery occurring	√	√	√	√	√	√	√	√	√				√
CP5	Review risk acceptance levels to ensure activities are best targeted	√	√	√	√	√	√	√						√
CP6	Develop proactive approach to safety issues where asset condition is a factor	√	√	√	√	√	√							√
CP7	Develop strategic approach to drainage / footpath renewal / upgrade	√			√	√					√	√		√
	RESILIENCE AND CLIMATE CHANGE													
RCC1	Update understanding of asset vulnerabilities and interdependencies	√	√	√	√	√					√			√
RCC2	Keep up to date with expected effects of natural hazards and climate change										√			√
RCC3	Have response plans for storm and climatic events	√	√	√	√	√	√							√
RCC4	Investigate potential mitigation options for the roading network	√	√	√	√	√					√			√
RCC5	Participation in lifelines work with Environment Southland and others										√			√
RCC6	Improve adaptive capacity and capability										√			√
RCC7	Promote mode shift to reduce dependency and impacts on travel by car					√			√	√			√	√

RCC8	Develop PT strategies and use policy settings to change behaviours					√			√	√			√	√
RCC9	Develop policies to support reduction in greenhouse gases					√			√	√			√	√
	ACCESSIBILITY													
A1	Multi-modal network optimisation & hierarchies across all modes	√				√			√	√				√
A2	Promote and encourage change for walking, cycling and public transport					√				√		√		√
A3	Implement travel behaviour programmes								√	√			√	√
A4	Ensure that new developments support modal choice													√
A5	Review freight routes and identify network changes or optimisation	√	√	√								√		√
A6	Determine and implement traffic changes to improve behaviours						√						√	√
A7	Work with regional groups to optimise community learning												√	√

7.3 SEALED ROADS PAVEMENTS

7.3.1 Sealed Roads Pavement Maintenance

Sealed roads pavement maintenance includes the activities shown in the table below:

Table 7.9 Sealed Road Pavement Maintenance

Waka Kotahi Work Category	Activity	Sub-activity	Comment
111	Sealed roads pavement maintenance	Pothole repairs	Routine reactive
		Dig-out repairs	Routine reactive
		Surface levelling	Planned, based on site inspections
		Edge break repairs	
		Crack sealing	
		Water cutting	
		Surface levelling	
		Trimming of high shoulders	
		Low shoulder filling	
		Stabilisation repairs	
		Pre-reseal repairs (activity types above)	Carried out prior to resurfacing

Maintenance activity is described below.

Table 7.10 Sealed Road Pavement Maintenance – Primary Types of Maintenance Activity

Work Type	Description
Inspections and monitoring	Asset defects inspection is regularly undertaken by the contractor with information used to establish a forward programme focus and provide input to preseal repairs (see below).
	Close monitoring of the network is possible due to the compact shape of the network and the combined and shared office of the Contractor and Engineers, also allowing the defects information to be added to / expanded as they undertake operational travel.
	Monitoring can also assist with establishing defect cause and best repair methodology.
	Information is recorded in RAMM Contractor.
Customer feedback	The Requests for Service system can be used by customers to advise of defects and assist in monitoring short term deterioration that may occur.
Prioritisation	Asset defects are prioritised with the earliest intervention being safety focused and driven strongly by ONRC hierarchy issues for users of the network
	Programmes for months 1 to 7 give a responsive picture to the network,
Maintenance delivery	Pavement issues which are likely to deteriorate or create safety issues are highlighted, monitored and repaired prior to the safety issue forming.
	As relatively expensive items, normal best industry practice is to hold on digouts and major repairs until such time as renewals can be justified. Levels of expenditure are monitored and compared to the net present value of a renewal to determine whether ongoing maintenance of the

	treatment length is optimal or not. If not, then it is more economically viable to look for a renewal option.
	Experienced practitioners understand this break point and will test the calculation and understand the levels of maintenance required. Good robust data on maintenance is required.
Pre-seal repairs	The defects list above form the basis of preseal repairs. These are reviewed and accurate programmes confirmed for early delivery, ready for resealing through separate contract.
JunoViewer analysis	The 2020 and 2023 Forward Work Programme (Appendix 8) reports suggest that the overall level of pavement investment historically undertaken has been reduced to too a low level and a higher intervention is needed to ensure pavements are able to deliver a suitable level of service.

A "one-page" summary relating to WC 111 and maintenance contract delivery is provided in Section 7.3.6.

7.3.2 Sealed Roads Pavement Renewals

NZTA's work categories for this asset are listed in the following table, and relate to the renewal of top surfaces and pavement layers.

Table 7.11 Sealed Road Pavements Renewals – Work Categories

Waka Kotahi Work Category	Activity	Sub-activity	Comment
212	Sealed road resurfacing	Various material types – includes Chip, AC, slurry, friction course / OGM	Programmed work
214	Sealed road pavement rehabilitation	Granular overlay	Programmed work
		Renovation / stabilisation	Programmed work
		Rip and remake	Programmed work
		Smoothing	Programmed work

The primary types of renewal work undertaken in the City are as follows:

Table 7.12 Sealed Road Pavements Renewals – Primary Types of Renewal Work

Work Type	Description
Resealing and Resurfacing – Sealed Roads **WC 212**	This work renews the impervious surface of the sealed carriageway, preventing entry of water and subsequent loss of pavement strength and surface deterioration. The importance of resealing in maintaining pavement strength and integrity levels is very high. The following principal techniques are used:
	Chip seal Cut-back or emulsified bitumen is sprayed, (hot, warm or cold depending on the seal-coat design) onto the prepared surface and is covered with stone chips. The bitumen waterproofs the surface and the stones protect the bitumen from wear while providing good adhesion for pneumatic tyres. This is the predominant resealing technique used.
	Slurry or Rejuvenation seal

	A mixture of fine aggregate and emulsified bitumen laid approximately 6 mm thick providing a high-friction surface with smooth ride characteristics. It typically has a short life.
	Asphaltic surfacing Mix of graded aggregate and asphaltic binder, generally in a 20-35mm layer. It is usually laid hot ('hot-mix') but cold-laid and cool-laid mixes are available.
	Friction Course / Open Graded Mixes Friction Course is a form of asphaltic surfacing used on roads where there are high stresses or high traffic volumes.
Overlays and Pavement Renewals **WC 214**	This work includes reconstruction, renovation or rehabilitation of existing pavements. In this context, area-wide treatments are least-cost maintenance solutions generally used to restore the strength of a pavement to its design specifications. The following techniques are available in this category:
	Full Reconstruction This is the removal of the existing base course and / or subgrade and replacement with new material. This is the most likely technique used on urban streets.
	Renovation Increasing the strength of existing base course / sub-base materials by chemical stabilisation such as adding a stabiliser (hydrated lime or cement) and re-compacting.
	Granular Overlay Primarily used in rural areas this technique involves constructing an additional layer of base course on top of the existing pavement.
	Rip and Remake A combination of treatments, which involves the pavement being ripped up, or milled, and re-laid in place by heavy plant. This technique can utilise the blending in of new materials and stabilisation measures. This is used when the existing pavement structure can be reused in a reconstituted manner.
Smoothing **WC 214**	This is the removal or reduction of irregularities in road surfaces where the structural condition of the carriageway is otherwise sound. Smoothing involves placing an additional layer of asphaltic surfacing or a granular overlay, with a new sealed-surface, on an existing sealed surface to smooth out irregularities. The techniques used are dependent on traffic volumes / road geometry and road condition.

"One-page" summaries relating to WC 212 and WC 214 are provided in Section 7.3.6.

The remainder of this section describes the results of analysis conducted to determine optimal investment strategies.

7.3.3 Sealed Roads Technical Analysis

Treatment Types

The pavement strategy is to select treatment candidates using a combination of methods to verify the treatments being suggested by the software using:

- JunoViewer analysis
- Site analysis and walk-overs
- RAMM treatment selection algorithm

RAPT tours are undertaken with peers to review and check that the programmes continue to be appropriate and agreed as necessary. Discussions are also held with Waka Kotahi to confirm the approaches taken and the level of understanding of the network.

JunoViewer is acknowledged as being a suitable tool for assisting with predicting renewals demands and has been customised to New Zealand conditions. It can establish and predict a range of options which will take into account historical and future maintenance demands and deliver programmes based around set budgets.

The programme can output a comprehensive range of data such as STE, roughness and Pavement Index indicators of future pavement condition and performance.

Each pavement is analysed to determine the most appropriate treatment, considering the function of the road (ONF/ONRC), traffic volumes and loading, the condition of the road, and associated factors such as drainage. Opportunities are also identified to coordinate the work with other roading activities (e.g. footpath or kerb and channel renewal) or other utility works (e.g. watermain replacement).

The following generic treatment types are considered in JunoViewer modelling:

1. Smoothing Treatment
2. Asphaltic or Chipseal Resurfacing
3. Pavement Rehabilitation

Treatments which are considered are:

Table 7.13 Sealed Road Treatment Types

ONRC Class	Urban	Rural
Arterial or Primary	• Stabilisation (cement) • Dig out Renewal (and or stabilise subbase) • Targeted Dig out (lanes only) • Mill and AC (Smoothing) Overlay	• Stabilisation (foam or cement) • Granular Overlay
Secondary	• Dig out of Failed areas only (AC surface) • AC Smoothing Overlay	• Dig out of Failed areas only (chip seal surface)
Access	• Patch and hold • Dig out of Failed areas only (chip seal surface)	• Patch and hold • Dig out of Failed areas only (chip seal surface)

Developing Renewal Programme Options

Various options are modelled for resurfacing (chipseal, asphalting) and rehabilitation. Two approaches have been used to test different budget and programme options:

- FWP assessment (including detailed onsite review)
- JunoViewer analysis

Of note is the risk associated with low SNP with asphaltic surfacing.

This is an indicator where the base materials are not strong and are very reliant on the asphalt for performance, although the asphalt is not seen as a structural layer. This risk could be early failure through cracking once the integrity of the surface has been compromised.

This has been seen in some areas where old trenches fail and allow water in, which creates a wide failure mechanism to be created.

Forward Works Programme Assessment

The FWP was developed in conjunction with the JunoViewer modelling work to test and refine the results of the analysis.

Field inspections involving both ICC technical staff and the JunoViewer analyst were carried out in deriving the FWP (Appendix 8).

This process identified candidates and decision on the nature of the treatment required. Initially developed as a 5-year view, this was extended to 10 years based on available information and engineering knowledge.

The following table compares the work identified for 2023/24 with the average 3-year and 10-year FWP schedules. These are treatment types identified for each period for both urban and rural roads. Assumed unit rates were used to determine the funding requirements for both the FWP and JunoViewer analysis.

Note for this AMP and the PBC, Year 1 is 2024/25 and Year 0 is the current year, 2023/24.

Table 7.14 Forward Works Programme Assessment

Treatment Type	Year 0 (19/20) $m	Year 0 (19/20) km	Average $m pa Yrs 1-3	Average km pa Yrs 1-3	Average $m pa Yrs 4-10	Average km pa Yrs 4-10
Chip Seal	$1.5	15.4	$2.5	30.2	$2.4	28.3
TAC[29]	$2.7	4.8	$3.8	5.1	$3.4	4.5
Rehab	-	-	$1.6	2.1	$1.2	1.5
TOTALS	**$4.2**	20.2	**$7.9**	**37.3**	**$7.0**	**34.3**

Year 0 = 2023/24

Conclusions drawn from the FWP analysis above are as follows:

- A significant increase in chip seal is needed in the first 3 years of the plan then expected to be relatively stable across the following 7-year period.
- A significant increase is needed for asphaltic concrete surfaces – largely due to surface deterioration, but also pavement roughness.
- Pavement rehabilitation needs can be managed at around 1.5-2km pa[30].

JunoViewer Analysis

JunoViewer predicts the future rate of deterioration of both surfaces and pavement layers over time, based on traffic volumes and a range of physical asset data.

[29] Thin Asphaltic Concrete

[30] Note that TAC smooths rough pavements and in many cases is a lower cost substitute than pavement renewal if the overall pavement structure has not degraded. This is recognised in both the FWP and JunoViewer modelling.

It uses intervention levels which relate to the ONRC category of each road as tabulated below to trigger a surfacing or pavement treatment in the year that it is required.

Table 7.15 JunoViewer Analysis

Urban/ Rural	ONRC Code	ONRC Description	ONRC Average Rough (NAASRA)	ONRC Target Rough (NAASRA)	Length (km)	% of Network Length	Wavg Rough (NAASRA)	Length (km) with NAASRA > Target	% of ONRC Length with NAASRA > Target	Smooth Travel Exposure (VKT <= Target)
Urban	LVol	Low Volume	140	180	31	6%	115	0	1%	100%
	Acc	Access	120	150	134	28%	115	12	47%	93%
	SCol	Secondary Collector	110	140	59	12%	107	9	36%	87%
	PCol	Primary Collector	110	140	42	9%	89	3	12%	92%
	Art	Artierial	100	130	28	6%	74	1	2%	98%
Rural	LVol	Low Volume	140	180	6	1%	83	0	0%	99%
	Acc	Access	120	150	50	11%	76	0	0%	100%
	SCol	Secondary Collector	110	130	62	13%	65	0	1%	99%
	PCol	Primary Collector	100	120	58	12%	67	0	1%	100%
	Art	Artierial	100	120	3	1%	72	0	0%	100%
Total					474	100%		24	5%	95%

The modelling work firstly considered investment options over a 10-year period. Funding scenarios were based on the following budget envelopes:

1. Budgets[31] of $5.8 to $8.5 million in $1 million increments with JunoViewer determining the optimal lifecycle treatment.
2. Similar budget increments but rationalised between rehabilitation[32] and resurfacing[33] treatments. The model could only work within these limits, even if it was sub-optimal to do so.

Expected maintenance costs and pre-reseal repair costs for each scenario were also generated. As would be expected, these costs are lower for higher resurfacing and renewal budgets.

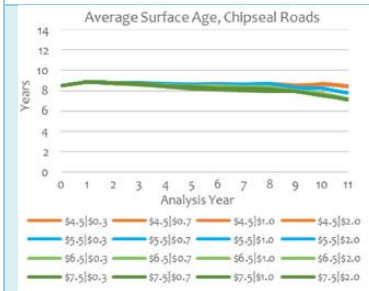
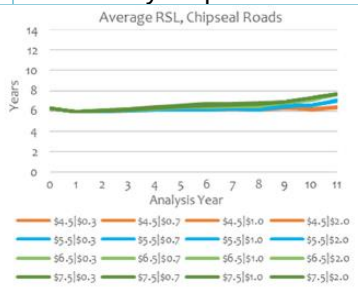
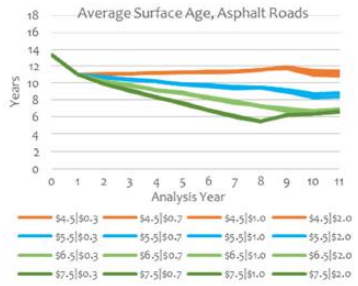
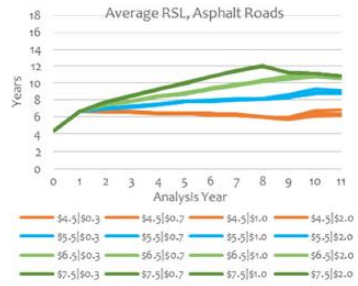
JunoViewer 10-Year Results

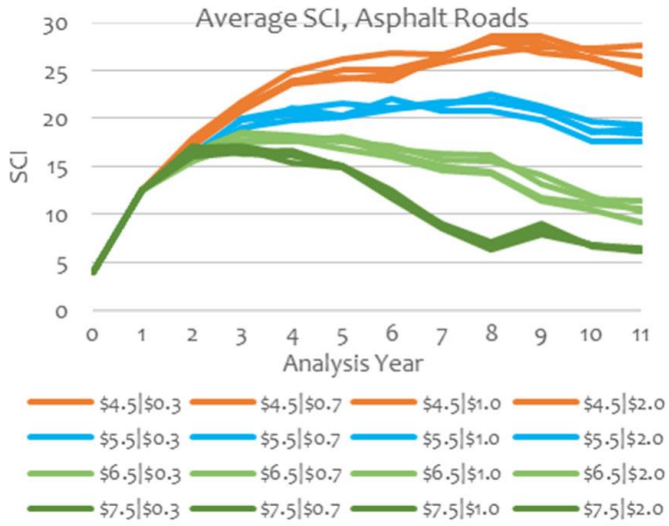
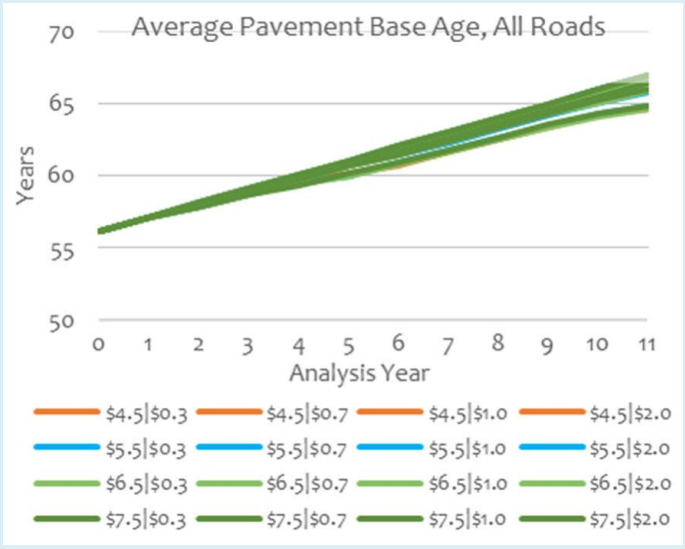
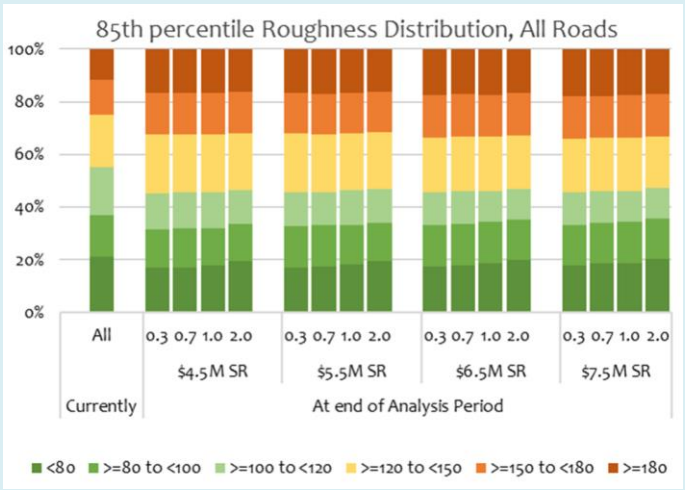
The following information was reported by JunoViewer over a 10-year period to 2034:

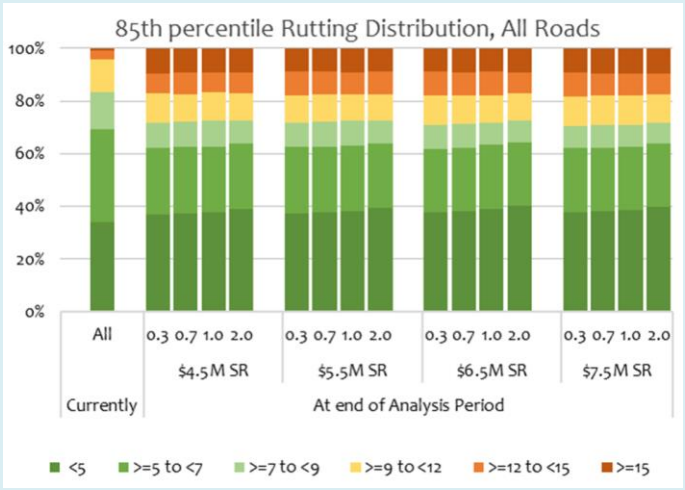
- Average network age and remaining surface life (RSL) for chip seal and TAC surfaces.
- Average network age for pavements.
- Surface Integrity Index (SII) – a composite condition and age indicator for pavement surfaces of all types.
- Roughness – a primary indicator of pavement condition. Target levels of service for roughness are described in the Pavement Performance Model Report (Appendix 9)[34].
- Pavement Condition Index (PCI) – a composite indicator that uses both SII and pavement condition.

[31] Note that the current budget is equivalent to $4.2m or Op.35
[32] Varying from $0m to $4.3m
[33] Mostly $3.6m with the lowest budget being $2.9m
[34] No current average roughness values are greater than the ONRC specified averages; with around 5% of the total network length having roughness exceeding the specified targets

Table 7.16 JunoViewer 10 Year Analysis

Indicator	Conclusions – Optimised Budget Scenarios	Key Comments
CHIP SEAL SURFACES		
Chip seal age and RSL and SII – chip seals (shown below)	All indicators are stable over the 10-year period for all budget scenarios, although with some fluctuations. RSL remains stable for all budgets, more funding would make a difference over a 10 year period..	All of the budget scenarios are adequate in preserving chip seal surfaces, even the reduced $4.5 million option. Larger budgets progressively allocate the additional funding to other treatments – in particular, TAC and rehabilitation.
 		
THIN ASPHALTIC C0NCRETE SURFACES		
TAC age and RSL (shown below)	There is significant variability between the options. Both age and RSL remain steady or improve for budgets of $5.5 million and over. However, age increases and RSL declines for budgets less than this, the latter in the diagram below.	The current budget ($2.7 million) results in average RSL approaching zero by 2050. **<u>This is unsustainable</u>**. $3.5 million is the minimum recommended budget level for managing the TAC life cycle, but even this sees a decline in RSL.
 		
SII – TAC	SII deteriorates quickly from. With this budget, SII worsens from around 5 now to over 25 by 2050.	If the current $2.7 million budget continued in the short to medium-term

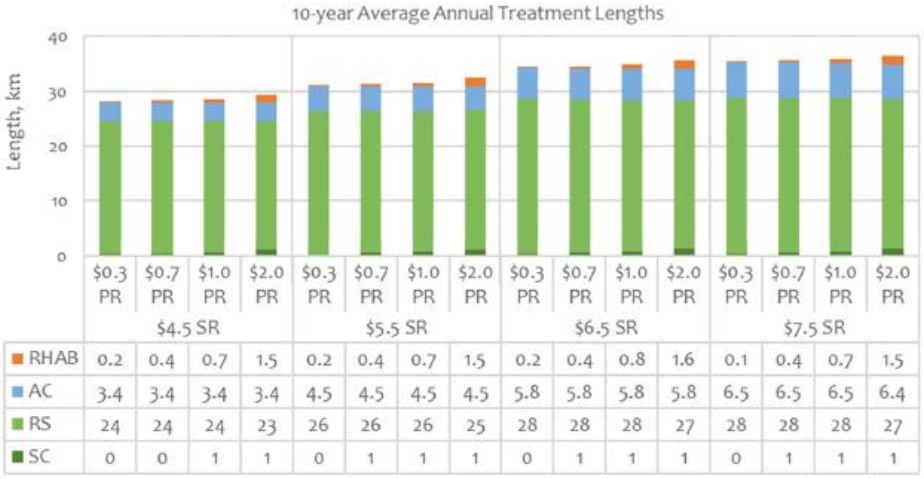
		(orange line), there would be a need <u>to lift it significantly</u> within the next 10 years to maintain condition. 5 km may be needed in the short term $3.5 million is the minimum recommended long-term sustainable budget to maintain condition of AC surfaces using this indicator.
PAVEMENT LAYERS		
Pavement age	Increases from around 54 years now to 65⁺ years depending on the budget scenario.	Even $2 million is not sufficient in the long term – this is demonstrated by the chart.
		
Roughness	Roughness trends are similar for all budget scenarios.	Average network roughness takes some years to get the point where significant levels of intervention are required.
		
Rutting	Rutting trends are also similar for all budget scenarios.	This is a similar story to roughness,



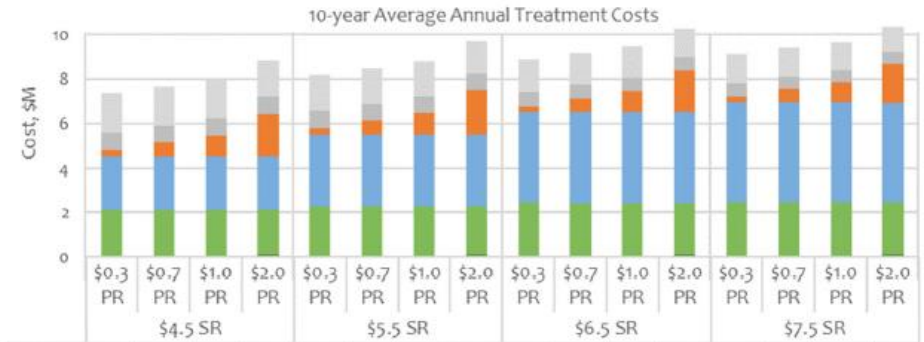
although it is expected to take longer for the need to become apparent.

A summary of the JunoViewer derived average annual programme costs and treatment lengths over the 10-year period is shown below.

As the budget is progressively increased, the model includes more TAC and rehabilitation treatments based on the threshold intervention levels. Treatments for individual sections of road are selected by JunoViewer based on economic optimisation principles.



	$0.3 PR	$0.7 PR	$1.0 PR	$2.0 PR	$0.3 PR	$0.7 PR	$1.0 PR	$2.0 PR	$0.3 PR	$0.7 PR	$1.0 PR	$2.0 PR	$0.3 PR	$0.7 PR	$1.0 PR	$2.0 PR
	$4.5 SR				$5.5 SR				$6.5 SR				$7.5 SR			
RHAB	0.2	0.4	0.7	1.5	0.2	0.4	0.7	1.5	0.2	0.4	0.8	1.6	0.1	0.4	0.7	1.5
AC	3.4	3.4	3.4	3.4	4.5	4.5	4.5	4.5	5.8	5.8	5.8	5.8	6.5	6.5	6.5	6.4
RS	24	24	24	23	26	26	26	25	28	28	28	27	28	28	28	27
SC	0	0	1	1	0	1	1	1	0	1	1	1	0	1	1	1



	$0.3 PR	$0.7 PR	$1.0 PR	$2.0 PR	$0.3 PR	$0.7 PR	$1.0 PR	$2.0 PR	$0.3 PR	$0.7 PR	$1.0 PR	$2.0 PR	$0.3 PR	$0.7 PR	$1.0 PR	$2.0 PR
	$4.5 SR				$5.5 SR				$6.5 SR				$7.5 SR			
Maint	1.8	1.7	1.8	1.6	1.6	1.6	1.6	1.5	1.5	1.4	1.4	1.3	1.3	1.3	1.3	1.2
PSR	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.7	0.6	0.6	0.6	0.6	0.6	0.5	0.5	0.5
RHAB	0.3	0.6	1.0	1.9	0.3	0.6	1.0	2.0	0.3	0.6	0.9	1.9	0.2	0.6	0.9	1.8
AC	2.4	2.4	2.4	2.4	3.2	3.2	3.2	3.2	4.1	4.1	4.1	4.1	4.5	4.5	4.5	4.5
RS	2.1	2.1	2.1	2.0	2.2	2.2	2.2	2.2	2.4	2.4	2.4	2.3	2.4	2.4	2.4	2.3
SC	0.0	0.0	0.1	0.1	0.0	0.0	0.1	0.1	0.0	0.0	0.1	0.1	0.0	0.1	0.1	0.1

Figure 4-1: Forecast Average Annual Length and Cost

Lifecycle Cost Comparisons

The following table summarises the average annual lifecycle costs over the 30-year period:

Table 7.17 Annual Life Cycle Costs

Treatment	Scenario	$0.3M PR lower	$0.3M PR upper	$0.7M PR lower	$0.7M PR upper	$1.0M PR lower	$1.0M PR upper	$2.0M PR lower	$2.0M PR upper
RHAB	Length, km	0.1	0.2	0.4	0.4	0.7	0.8	1.5	1.6
	Cost, $M	**$0.2**	**$0.3**	**$0.6**	**$0.6**	**$0.9**	**$1.0**	**$1.8**	**$2.0**

Treatment	Scenario	$4.5M SR lower	$4.5M SR upper	$5.5M SR lower	$5.5M SR upper	$6.5M SR lower	$6.5M SR upper	$7.5M SR lower	$7.5M SR upper
SC	Length, km	0.3	1.2	0.3	1.2	0.3	1.4	0.3	1.4
RS	Length, km	23	24	25	26	27	28	27	28
RS + SC	Length, km	24	25	26	26	28	29	28	29
RS + SC	Cost, $M	**$2.1**	**$2.1**	**$2.3**	**$2.3**	**$2.4**	**$2.4**	**$2.4**	**$2.5**
AC	Length, km	3.4	3.4	4.5	4.5	5.8	5.8	6.4	6.5
	Cost, $M	**$2.4**	**$2.4**	**$3.2**	**$3.2**	**$4.1**	**$4.1**	**$4.5**	**$4.5**
Total Prog	Length, km	28	29	31	32	34	36	35	36
	Cost, $M	**$4.8**	**$6.4**	**$5.8**	**$7.5**	**$6.8**	**$8.4**	**$7.2**	**$8.7**
Maint + PSR	Cost, $M	**$2.4**	**$2.6**	**$2.2**	**$2.4**	**$1.9**	**$2.1**	**$1.8**	**$1.9**

Assumptions to note:

- Maintenance includes both routine and pre-reseal repairs.
- The "budget options" relate to renewal costs only.
- Costs shown are the amount spent and do not necessarily reflect the value or consider the residual asset value or whole of life costs.

Key Conclusions – that can be drawn from the JunoViewer analysis

- The current 2023/24 funding level of around $4.2 million for resurfacing and rehabilitation is not financially sustainable in the long term.
- While chip seal resurfacing can be accommodated within this budget, the treatment of deteriorating asphaltic concrete surfaces and pavement layers cannot.
- A sustainable budget level of at least $7.6 million per annum is considered desirable in order to preserve the assets and the levels of service they provide to road users in the city. This largely addresses asphaltic concrete surfaces.
- In the long term, this budget will need to be further increased to accommodate pavement rehabilitation needs, which start to increase significantly from the mid 2030's.

7.3.4 Sealed Roads Programme Evaluation

Assessment of Options

The MCA shown on the following page ranked the following options for sealed pavements maintenance and renewals in order of preference:

1. Increase the maintenance programme (WC 111) to address defects across the network – this would include pre-seal repairs. Requires a moderate budget increase. [Option 9 – Score 1.6]

2. Increase the thin AC resurfacing programme (WC 212) to address age and condition issues across the network. Requires a significant budget increase. [Option 4 – Score 0.95]
3. Allow more variability of LoS and risk profiles across the network based on ONRC level – for example, accept more defects on lower volume roads but improve busy roads. Allows for a minor budget increase. [Option 10 – Score 0.6]
4. Reduce LoS by allowing roads to become rougher across the network, while managing skid resistance for safety reasons. This constrains the budget to current or near-current levels. [Option 2 – Score -0.55]
5. Increase risk, holding assets longer and allowing more failures of both pavement surfaces and pavement layers, while managing skid resistance. This constrains the budget to current or near-current levels. [Option 5 – Score -1.0]

Furthermore, JunoViewer modelling showed:

- An even higher level of pavement maintenance is required for lower renewals investment – the "$2.4 million" JunoViewer budget.
- Sub-options for renewals investment ranged from the current level of up to $9.5 million.

The results of the MCA are shown below.

PBC Multi Criteria Option Analysis, RCA: Invercargill City Council

Activity/Work Categories: Sealed Roads (WC 111, 212, 214)

Short list up to 3 options from the following:

No.	Option - Can we make	Yes/No	Rank	Reason
1	❑ Intervention response timing change			
2	❑ LoS adjustments	Yes	4	Reduce LoS and allow roads to become rougher while managing skid resistance - constrain budget
3	❑ Use existing assets differently			
4	❑ Blending Work Categories differently	Yes	2	Increase thin AC resurfacing programme to address age and condition issues - increase budget
5	❑ Risk - Hold Assets longer	Yes	5	Allow more failures on pavements (surfaces and layers) while managing skid resistance - constrain budget
6	❑ Managing demand			
7	❑ Route Management			
8	❑ Alternative approaches – different solutions/technology			
9	❑ Maintenance vs Renewal adjustments	Yes	1	Increase maintenance programme to address defects - increase budget
10	❑ ONRC Classification variance	Yes	3	More variability of LoS and risk profiles based on ONRC - e.g. accept more defects on lower volume roads, improve busy roads. Minor budget increase.
11	❑ Extended temporary management			
12	❑ Supply chain improvements			
13	❑ Improve systems and capability			

			How good is this option													
	Criteria	Weighting (Importance) (Total to 100%)	Option 2 - reduce LoS, roughness increases, budget constrained		Option 4 - increase AC resurfacing programme		Option 5 - accept higher risk profile except for skid resistance, budget constrained		Option 9 - increase maintenance budget		Option 10 - alignment of failure risk profile with ONRC					
			Raw	Score	Raw	Score	Raw	Score	Raw	Score	Raw	Score	Raw	Score	Raw	Score
	Contribution to community outcomes and/or strategic objectives	10%	-1	-0.1	1	0.1	-1	-0.1	1	0.1	0	0		0		0
	Effectiveness in addressing ICC problem statements and achieving investment benefits	20%	-2	-0.4	2	0.4	-2	-0.4	3	0.6	1	0.2		0		0
	Impact on road safety outcomes	10%	0	0	2	0.2	0	0	1	0.1	0	0		0		0
	Impact on levels of service including ONRC related	10%	-2	-0.2	1	0.1	-2	-0.2	2	0.2	1	0.1		0		0
	Impact on risk e.g. asset failure, reputational risk	15%	-1	-0.15	2	0.3	-2	-0.3	2	0.3	1	0.15		0		0
	Impact on asset preservation and "whole of life" cost outcomes	15%	-1	-0.15	2	0.3	-2	-0.3	3	0.45	1	0.15		0		0
	Community affordability	15%	3	0.45	-3	-0.45	2	0.3	-1	-0.15	0	0		0		0
	Environmental impacts	5%	0	0	0	0	0	0	0	0	0	0		0		0
				0		0		0		0		0		0		0
	Totals	100%		-0.55		0.95		-1		1.6		0.6		0		0

Recommended Programmes

The recommended programme is based on Options 1 and 2 above. Options 4 and 5 both result in negative outcomes overall and are not recommended. Instead, an

approach that allows for increased variability in terms of condition and risk based on ONRC categories (Option 3) can be used to mitigate the impact of constraining budgets to less than that recommended.

This approach adopts the long-term JunoViewer $7.5 million budget renewal strategy, with a ramping up occurring over the first three years.

A summary short term maintenance forecast is described in the following table:

Table 7.20 Sealed Roads Short Term Forecasts ($000)- Not inflated)

WC Code	WC Description	Current	Yr. 1	Yr. 2	Yr. 3	Total	Total
		23/24	**24/25**	**25/26**	**26/27**	**24-27**	**2021-24**
111	Sealed pavement maintenance	$2,489	$2,300.0	$2,300.0	$2,300.0	$6,900.0	$6,752.0

Although it appears that there is a reduction from 2023/24 to 2024/25, the 3 year totals have increased, this is due to pre-seal repairs have not been carried out in the 2022/23 for 2023/24 resurfacing programme, so there will be a catch up spend undertaken.

10 year forecasts are provided in the next table:

Table 7.21 Sealed Roads 10 Year Forecasts ($000) – Not inflated)

WC Code		24/25	25/26	26/27	27/28	28/29	29/30	30/31	31/32	32/33	33/34
111		$2,300	$2,300	$2,300	$2,300	$2,300	$2,300	$2,300	$2,300	$2,300	$2,300

A summary short term renewal forecast is described in the following table:

Table 7.22 Sealed Pavements Short Term Forecasts ($000) – Not inflated)

WC Code	WC Description	Current	Yr. 1	Yr. 2	Yr. 3	Total	Total
		2023/24	**2024/25**	**2025/26**	**2026/27**	**2024-27**	**2021-24**
212	Sealed road resurfacing	$4,533.0	$6,100.0	$5,824.0	$7,722.0	$19,646.0	$11,348.0
214	Sealed road pavement rehabilitation	$0	$1,300.0	$0.0	$3,753.0	$5,053.0	$1,889.0

10 year forecasts are provided in the next table:

Table 7.23 Sealed Pavements 10 Year Forecasts ($000) – Not inflated)

WC	24/25	25/26	26/27	27/28	28/29	29/30	30/31	31/32	32/33	33/34
212	$6,100.0	$5,600.0	$7,200.0	$5,461.0	$5,185.0	$4,715.0	$4,479.0	$4,479.0	$4,479.0	$4,479.0
214	$1,300.0	$0.0	$3,500.0	$500.0	$588.0	$500.0	$500.0	$588.0	$500.0	$500.0

Specific forecasting assumptions, although no significant changes are forecast:

- Sealed road maintenance costs will increase in proportion to the increase in sealed road length.
- Sealed road maintenance costs will increase proportionately with general traffic growth across the network.

7.3.5 Sealed Roads Capital Development

Council Projects

The Council Infrastructure Strategy (IS) is not to grow but plan to maintain existing assets.

There are no new road construction projects in WC324.

City Centre roads have included an allowance of $2.2 million to undertake some renewal works which are essential to align with the planned development. These are primarily in Esk, Kelvin and Dee Street which is showing high stress in paving block areas. Its LoS for its place function are not aligned.

A number of smaller and / or safety driven projects are planned to be delivered via WC 341 Low Cost Low Risk and Inner City footpaths (via WC 225).

Council has a deficiency database of risks (Appendix 10) and has been working with the Waka Kotahi Road to Zero Safe Networks Team which has identified a range of works where safety interventions will return (theoretically predicted) a range of decreases in DSIs. These will be prioritised for development works and aligns with the Problem Statement identified earlier. The improvement of safety planned is a key activity needed.

Subdivisions

New sealed roads are vested in Council following subdivision development, the current projection of new asset creation is as follows, km of roads added for the Tramway / Rockdale Road will have the most significant impact with roughly 10km of new roads proposed:

Table 7.24 Sealed Roads – Subdivision Locations

Location of Subdivision	Lots Est.	Potential Date
Inverurie Stages 3-5	35	2025
Ascot Heights – Completion	15	2025
Tramway / Rockdale	600	2027
Otatara Road	20	2028

Seal Extensions

Seal extensions of unsealed roads are regularly requested by property owners. This was considered by Council as part of the Long Term Plan to either extension fully or partially funded by Council and private funders. Council has decided that this investment cannot be made as this time due to affordability issues.

It is accepted that private funding can occur and financial mechanisms may be available on a cost recovery basis from Council.

7.3.6 Sealed Roads Programme Story on a Page

The following pages provide “one-page” summaries for each of the major work categories 111, 212 and 214, covering maintenance and renewal programme needs for resurfacing and rehabilitation.

These provide comparative peer information, summary asset condition and management activities information, and describe the recommended programmes for each category.

An additional page describes the relationship between renewal work categories and pavement maintenance.

Sealed Road Maintenance – Activity Management Plan

Background Information – **W/C 111**

Prepared By: Lesley McCoy		Approved By: Doug Rodgers	Date: 10/23	Revision 5.

1. Contract Delivery

Sealed Pavement Maintenance is the most significant activity completed as part of Contract 1167 – Road Maintenance by Fulton Hogan.

2. Historical Expenditure

The total expenditure for the three year block is shown in the table below but the actual expenditure for 2022/23 is made up of:

- Routine Pavement Repairs - $1,731,117
- Pre Reseal Repairs - $350,446

Year	W/C 111 $(k)	Actual $(k)
2021/22	$1,500	$2,191
2022/23	$1,540	$2,082
2023/24*	$2,489	$599*

* To Sept 2023

3. Current Network Condition

Condition rating surveys are undertaken on the sealed road network at three yearly intervals. This was last completed by in February 2022. The urban high use roads were 100% surveyed with the urban low use and all rural roads using a 10% sample. Sealed road roughness surveys are also undertaken two yearly. The latest survey was undertaken in April 2022.

In 2022, the full network was surveyed in an 'all defects' survey which is a 100% survey to prioritise defects. The results of this work are shown in the adjacent image and the total cost to repair all of these was $2.5M. It shows that almost 50% of the defects are on the arterial network that carries the highest traffic volumes but only make up 7% of the network by length.

The breakdown of the defects by type is shown in the table below:

Defect Type	Watercutting	Crack Sealing	Stabilisation	Digouts	Rip and Remakes	Total
Total Cost of Repair	$1,623,436	$465,786	$257,028	$163,099	$60,666	$2,560,018

Roads which are not adequately maintained and renewed will over time become increasingly unfit for purpose and the level of resilience will likely decrease. Safety performance will also decline over time; for example, as pavement surfaces become less skid resistant and delineation and signs lose legibility and reflectivity.

While the network is ageing and there are signs of deterioration, the available evidence shows that the assets are generally robust. However, the key challenge relating to condition and performance is maintaining the asset in a "fit for purpose" state in an efficient and cost-effective manner. Greater knowledge can come from improved monitoring and modelling.

Modelling / Condition Assessment: Consider an enhanced data collection and modelling framework that could include annual RAMM Condition rating of an annual All Defects survey. JunoViewer is a useful tool to display the condition trends and video records of road conditions.

4. Comparison with Peers

Invercargill City sealed road maintenance costs are just below the mean of our peer group.

The cost per km is higher than some due to the nature of the network with very wide roads and many of the arterial and primary collector roads having asphaltic concrete surfaces resulting in higher maintenance and restoration costs after repairs.

5. Maintenance Options

Our maintenance contractor Fulton Hogan has developed and is refining its Maintenance Intervention Strategy (MIS) for asset maintenance and renewals. The MIS is used to optimise maintenance activities against planned works by providing guidance on when to intervene with an appropriate treatment response, i.e. monitoring, maintenance, holding prior to renewal or capital works.

A MIS is created once the forward works programme (FWP) has been established. Each treatment length or asset will have a nominated type or code, which will guide maintenance treatments prior to the implementation of the periodic treatments defined by the FWP.

Roads can be grouped in any way, such as using ONRC categories or by road use like HPMV and 50Max routes which may have different impacts on the maintenance demands.

6. Maintenance Programme Management

Programming – Once defects have been identified, logged in RAMM Contractor, assigned a priority and a treatment has been selected, the physical repair needs to be programmed for delivery within a defined period. The objectives of the programming process are to achieve:

- Integrated programmes (efficient delivery)
- Coordination with other work
- Pre seal repairs done one season early
- Multiple activities covered on one pass
- Coordination with peak traffic times
- Optimised treatment by road classification
- Minimal TTM sets ups and disruptions
- Coordination with renewal programmes
- Prioritisation according to risk

Cyclic Programmes – Cyclic and routine maintenance teams cover designated routes on which they complete tasks (find and fix) as well as urgent repairs identified by others.

Budget Control – Sealed Road maintenance requires careful management and prioritisation of the available funds as there is more work than funds available. The use of the MIS ensures that funds are spent where there is the greatest priority. Council has also endeavoured to deliver pre seal repairs one season ahead of the sealing work which is industry best practice.

Procurement: With the new Collaboration style Road Maintenance Contract there is greater scope to ensure best for network delivery with actual cost reimbursement and not a schedule of rates, which can at times lead to the inappropriate selected treatment.

7. Linkage to Capital Programme

The Capital Programme is developed using JunoViewer modelling. The modelling uses the Pavement Condition Indexes of roughness, rutting, texture and also the Surface Integrity Index (SII) which is a function of surface age and surface condition.

The modelling indicates that with higher funded optimised budget scenarios that the PCI can be maintained but at current levels of funding that deterioration will be evident from 2029/30. The table below shows the optimised budget. If this programme is funded then additional preseal repairs will be required to meet the increased volume of work.

Activity	2024/25 ($k)	2025/26 ($k)	2026/27 ($k)
Rehabilitation	$1,300	$0	$3,500
Thin Asphaltic Concrete	$3,700	$3,100	$4,600
Chipsealing	$2,400	$2,500	$2,600

This higher level of expenditure continues for all of the next 10 years modelled.

8. Forward Programme

Delivery of maintenance activities is driven by the programmes which are developed to allow resource optimisation (operational efficiency) and to ensure road user disruption is minimised. Routine programmes are driven by repairs to keep the pavement safe where failure to act could lead to accidents or much more expensive treatments if no action is taken. As monthly works programmes are completed, regular inspections, compliance monitoring and condition surveys are used to monitor performance. From these inspection activities, the maintenance and inspection regimes can be amended accordingly.

All visible defects and potential preseal repairs are assessed and captured on-site using RAMM Contractor. The quantity of preseal repairs required for the different sealing options to be successful is determined by the Contract Management Team using their experience and judgement. The repairs are not about seeking perfection with drainage repairs to prevent water ingress, pavement failures and levelling access covers considered a bare minimum. Pavement levelling is not usually completed as a preseal repair unless urgent.

W/C	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030-2034	2034-2038	2038-2042	2042-46	2046-2050	2050-2054
Routine	$1,500	$1,500	$1,500	$1,500	$1,500	$1,500	$4,500	$4,500	$4,500	$4,500	$4,500	$4,500
Preseal	$800	$800	$800	$800	$800	$800	$2,400	$2,400	$2,400	$2,400	$2,400	$2,400
111 $(k)	$2,300	$2,300	$2,300	$2,300	$2,300	$2,300	$6,900	$6,900	$6,900	$6,900	$6,900	$6,900

Sealed Road Resurfacing – Activity Management Plan

Background Information – W/C 212

Prepared By: Lesley McCoy		Approved By: Doug Rodgers		Date: 10/23	Revision 5.

9. Contract Delivery / Assets Maintained

Sealed Road Resurfacing is currently managed under Contract 944 – and for the first time it was let as a two year (plus one) contract. The contract includes both thin asphalt and chip seal and is held by Downers.

10. Historical Expenditure

The total expenditure for the approved three year block is shown in the table below but the actual expenditure for 2022/23 was made up of:

- Chipseal Resurfacing - $2,661,736
- Thin Asphaltic Resurfacing - $997,321

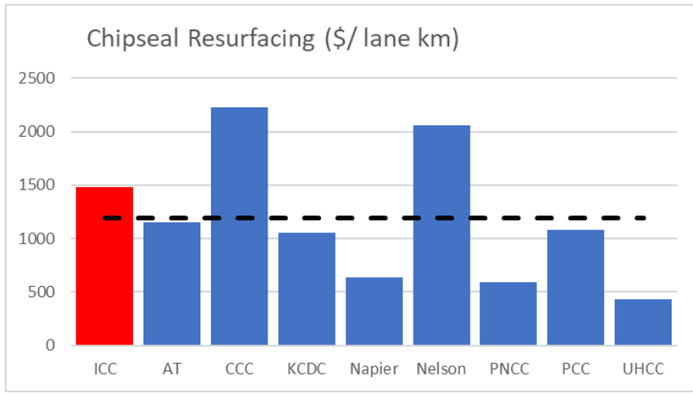
Year	W/C 212 $(k)	Actual $(k)
2021/22	$2,958	$2,202
2022/23	$3,857	$3,659
2023/24*	$4,533	$0

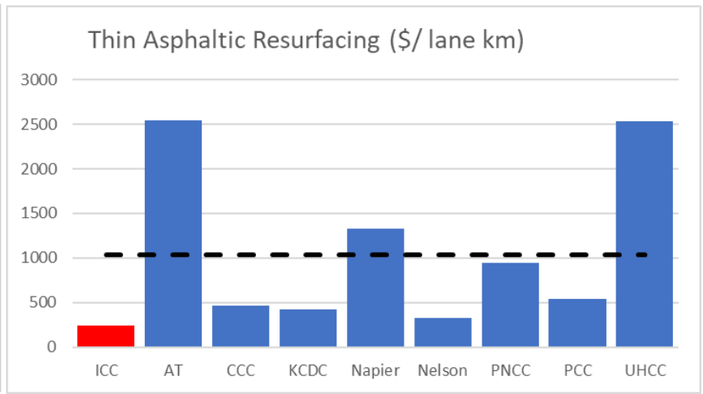
* to Sept 2023

11. Comparison with Peers

The cost of Chipseal Resurfacing is above the mean cost per lane km for our peer group and as there is very little Thin Asphaltic Resurfacing the cost is the lowest of the peer group.

When considering asset intensity overall sealed road resurfacing the $/m2 for Invercargill is $8.70 against an average of $10.23 for the Peer Group





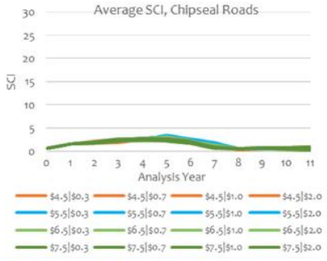
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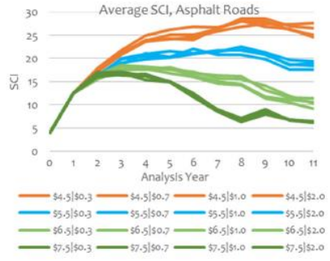
12. Model Outputs

The network has been modelled using the existing budget increased by a range of percentages. High is $7.5M, $6.5M, $5.5M, $4.5M, Normal (2021-24) is $4.3M and Low is $2.9M. Colours on the charts range from orange for LOW thru shades of blue to dark green for HIGH.

Resurfacing need can be monitored by trends in the Surface Integrity Index (SII) which is a function of surface condition, such as cracking, flushing and potholes as well as surface age.

- For Chipseal SII is maintained over the analysis period for all budget scenarios as because even at low budgets there is adequate funding to do chipseal.
- For Asphalt SII is maintained or improves over the analysis period when the optimised scenarios has sufficient funding that can be directed to asphalt resurfacing. The $5.6 million budget scenario is able to maintain the current level of SII.





- Some of the SII improvement can be attributed to treatment of old/aged surfaces and the application of routine maintenance, particularly crack repairs in the model.

13. Programme Management

Programming –A number of factors are taken into account to determine the annual sealed road resurfacing and rehabilitation programme including:

- Age of construction existing sealed surface
- Road classification and overall performance
- Visual inspection to confirm the indicated condition
- Other infrastructure demands that may delay work i.e. water and drainage renewals
- Traffic volume and type
- Condition based on the ratings survey data
- Expected contract rates and available budget for the works
- Geometry and use of road
- Roughness based on the roughness survey data
- Proximity of other sections that need surfacing

Materials – When selecting the material to be used for top surfacing, we consider the following factors:

- Condition and texture of the surface and the size of the existing chip
- The proximity of dwellings to the carriageway and the potential for noise nuisance such as the CBD.
- Skid resistance (PSV) and safety
- ORNC classification, percentage of heavy vehicles, and road geometry
- Need for waterproofing
- The strength of the existing road formation.

Skid Resistance: A review of skid resistance issues is required in consideration of intersection-related crashes, urban / rural mix and speed for rural (scrim actions), wet weather crashes and crashes where the road has been identified as being a contributing factor to the crash.

Materials: Consider increased use of polymer modified binder in high stress situations to reduce the need to use high cost asphalt on sites where that is an option.

14. Linkage to Maintenance Programme

An increase is required for pre seal repairs to match the increased sealing programmes due to a significant increase in resealing from 24/25 both in chip sealing and asphaltic paving.

Delivery of pre reseal preparatory repairs the year prior to resurfacing treatments is considered best practice in pavement operations and enables resurfacing to be done at the most optimal time of the year rather than being delayed.

15. Model Priorities

The funding resource is used to its full capacity in each scenario throughout the analysis period suggesting that, even at the HIGH scenario funding, the network is not overfunded;

The priority is to satisfy the resurfacing needs and apply more expensive renewal where possible after that; and

Therefore, the higher funding resulted in more TAC treatments and a gradual introduction of rehabilitation treatments as funding increased further.

In the Model, the resurfacing treatment is a priority treatment because it offers asset preservation and improvement (when required) at the most economic price, the TAC treatment is a priority over rehabilitation treatment because it offers a level of asset preservation and sufficient improvement at a better cost.

16. Forward Programme

Resurfacing Renewal – Chipseal: 26 km to 30 km ($2.2 to $2.6 million). The suggested range of 28 km is 7.0% of the network length per year and will result in a life-cycle of 14.3 years. Asphalt: 4.0 m to 5.0 km ($2.8 to $3.5 million). The suggested 4.5 km is 6.2% of the network length per year and will result in a lifecycle of 16.1 years. The suggested rehabilitation length is anticipated to provide an additional 1.5 km/year of new surface, this represents 0.3% network length per year average pavement life cycle of 316 years. Therefore, the suggested surface renewal would be in the range of at least 31.5 to 36.5 km/year when accounting for the rehabilitation treatments.

The Long Term Plan includes a Department of Internal Affairs mandated Level of Service to show the percentage of the sealed local road network that is resurfaced each year. For the 2021-2031 LTP this is set at 6.25%. This equates to targeting resurfacing on a 16 year cycle. The values included in the table below correlate with this Level of Service and ensure we will meet the target and maintain sealed road surfaces to the acceptable and safe standard expected and accepted by the community.

W/C	2024/25	2025/26	2026/27	2027/28	2028/29	2029/2030	2030-2034	2034-2038	2038-2042	2042-2046	2046-2050	2050-2054
CHIP	$2,400	$2,500	$2,600	$2,800	$2,400	$2,500	$7,200	$7,200	$7,200	$7,200	$7,200	$7,200
TAC	$3,700	$3,100	$4,600	$4,200	$3,100	$3,600	$10,500	$10,500	$10,500	$10,500	$10,500	$10,500
212 $(k)	$6,100	$5,600	$7,200	$7,000	$5,500	$6,100	$17,700	$17,700	$17,700	$17,700	$17,700	$17,700

Sealed Road Rehabilitation – Activity Management Plan

Background Information – W/C 214

Prepared By: Merv Gunn		Approved By: Russell Pearson		Date: 04/20	Revision2.

17. Assets Maintained / Project Delivery

Rehabilitation projects are packaged and let as combined or separate contracts depending on the scale of the work each year.

18. Historical Expenditure

The total expenditure for the approved three year block is shown in the table below:

Year	**W/C 214** $(k)	**Actual** $(k)
2020/21	$1,300	$1,277
2019/20	$719	$776
2018/19	$	$1,293

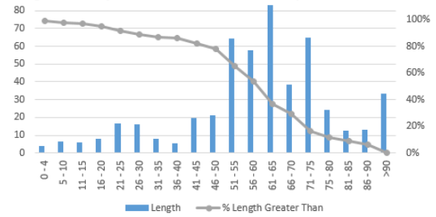
19. Current Network Condition

The Capital Programme is developed using JunoViewer modelling. The modelling uses the Pavement Condition Index (PCI) which is a function of roughness, rutting, texture and also the Surface Integrity Index (SII) which is a function of surface age and surface condition.

The modelling indicates that with higher funded optimised budget scenarios that the PCI can be maintained over a ten year period but at current levels of funding that deterioration will be evident from 2029/30. The table below shows the optimised budget.

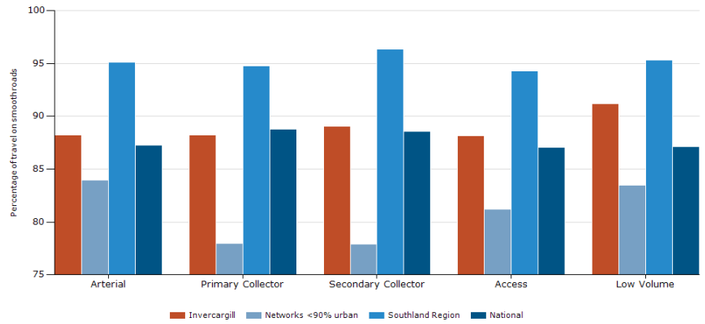
Pavement age information can be a guide to historic pavement rehabilitation, construction, and historic funding levels.

The network average pavement age is 56 years and 80% of the pavements have age older than 50 years. Based on RAMM data, over the past 5 years, the average annual achievement was 1.6 km (0.3%) equating to approximately 316-year renewal return period.



20. Comparison with Peers

Smooth Travel Exposure is the percent of travel on roads smoother than given thresholds for each traffic group better than our peers, less than region and similar to national Results. The STE trend is declining for Invercargill over the last 5 years. This result is not surprising considering the lack of investment.



21. Model Outputs

The network has been modelled using the existing budget increased by a range of percentages. High is $2.0M, $1.0M, $0.7M, $0.3M, Normal is $1.5M and Low is $0.2M.

The Pavement Condition Index (PCI) is a composite index that is a function of surface condition: cracking, flushing and potholes, surface age, which is activated when the design life is reached and the pavement base represented by roughness, rutting and texture.

The current average PCI value is 57. All scenarios show that PCI will deteriorate over a 30-year period. In general, the Trigger Model deteriorates because of Surface Integrity and the Optimal Model deteriorates because of roughness and rutting which is a reflection of insufficient rehabilitation.

22. Managing Levels of Service

Maintenance Strategy – Roads which are not adequately maintained and renewed will over time become increasingly unfit for purpose and the level of resilience will likely decrease. Safety performance will also decline over time; for example, as pavement surfaces become less skid resistant and delineation and signs lose legibility and reflectivity.

While the network is ageing and there are signs of deterioration, the available evidence shows that the assets are generally robust. However, the key challenge relating to condition and performance is maintaining the asset in a "fit for purpose" state in an efficient and cost-effective manner. Greater knowledge can come from improved monitoring and modelling.

Specific levels of service which are identified as possibly being too high will be put through a testing cycle of:

- Reduction of level of service in incremental steps for example chipsealing over roads that have previously had slurry and cape seals which are smoother surfaces
- Monitoring of the level of customer feedback

We will use comparative analysis of the number of defects identified to the level of customer feedback to highlight if the level of service drop is perceived or real.

Modelling / Condition Assessment: Consider an enhanced data collection and modelling framework that could include annual RAMM Condition rating of an annual All Defects survey. JunoViewer is a useful tool to display the condition trends and video records of road conditions.

23. Linkage to Maintenance Programme

An increase is required for pavement maintenance repairs to address the problems identified on roads where rehabilitation projects are needed but do not meet the threshold for a positive NPV using NZTA economic evaluation procedures.

This higher level of expenditure on sealed road maintenance continues for all of the next 10 years modelled by JunoViewer..

24. Renewal Options

This work includes reconstruction, renovation or rehabilitation of existing pavements. In this context, area-wide treatments are least-cost maintenance solutions generally used to restore the strength of a pavement to its design specifications. The following techniques are available in this category:

- Full Reconstruction - This is the removal of the existing base course and/or subgrade and replacement with new material. This is the most likely technique used on urban streets.
- Renovation
- Granular Overlay
- Rip and Remake

25. Forward Programme

The modelled need for Rehabilitation Renewals is between 0.1 km to 1.6 km per annum ($0.2 to $2.0 million). The suggested range is similar to the past 10-year average achievement and is within the range of the High budget but well below the Trigger Model outcome. Few rehabilitation treatments area prioritised to the programme at the Normal budget of $1.5 million or even at the suggested programme of $2 million. This is a financial constraint as the model needed to cater for asphalt resurfacing needs At 4.5 km, this will result in a life-cycle of 125 years.

At the allocation of $1.2 million from 2024/25 which is sufficient to rehabilitate approximately 1.5km, that results in a life cycle of 333 years.

W/C	2024/25	2025/26	2026/27	2027/28	2028/29	2029/2030	2030-2034	2034-2038	2038-2042	2042-2046	2046-2050	2050-2054
214 ($k)	$1,300	$0	$3,500	$1,200	$1,200	$1,200	$3,600	$3,600	$3,600	$3,600	$3,600	$3,600

Sealed Road Programme Development

Interrelationships between Surfacing, Rehabilitation and Maintenance

Prepared By: Merv Gunn		Approved By: Russell Pearson	Date: 04/20	Revision 1.

26. Assets Maintained

The length of sealed road maintained by ONRC classification is as follows:

ONRC	Length (km)	%
Arterial	31	7
Primary Collector	100	21
Secondary Collector	121	26
Access	187	40
Low Volume	35	7
Total	**476**	

The roading assets in June 2022 have a replacement value of about $690 million, and a current value of $280 million. The assessed annual depreciation (or consumption of the assets) is $12.3 million

27. Interrelationships

Renewal treatments such as pavement rehabilitation and resurfacing are programmed and carried out when they can be economically justified.

Surfacing is typically a twin coat emulsion chipsealing or asphaltic concrete overlay. AC is only utilised in high volume areas and in the CBD and other locations where noise or turning movements can cause surface damage.

Rehabilitation includes reconstruction or renovation of existing pavements. In this context, area-wide treatments are least-cost maintenance solutions generally used to restore the strength of a pavement to its design specifications.

The balance of work is maintenance and when maintenance costs get high this trigger's renewals.

28. Programme Development

Pavement Modelling Software JunoViewer has been utilised by an external consultant (IDS) to model the network and to establish the options to consider. The analysis and the field validation and peer review are robust and reliable and some confidence can be given to this work and their results. The results align well with the consultants field observations and experience from staff.

The main objective of the analysis is to:

- Determine the optimal funding split between resurfacing and rehabilitation renewal treatments
- Check the appropriateness of the current funding levels

The model has been developed with a detailed ten year programme with a forecast out 30 years with a view from previous reviews of the condition trends of the network using a 40 year horizon.

The charts from the longer-term model are used here to indicate the condition trends on the network.

The modelling indicates a significant increase in resealing from 24/25 both in chip sealing and asphaltic paving. This will lead to an increase required for pre seal repairs to match the increased sealing programmes.

Also noted is the risk associated with low pavement strength with asphaltic surfacing. This is an indicator where the base materials are not strong and are very reliant on the asphalt for performance, although the asphalt is not seen as a structural layer. This risk could be early failure through cracking once the integrity of the surface has been compromised. This has been seen in some areas where old trenches fail and allow water in, which creates a wide failure mechanism to be created.

29. Asset Condition Summary

The condition assessment of pavements is undertaken using RAMM visual rating inspections, high speed data collection (roughness, rutting and macrotexture), skid resistance surveys, and falling weight deflection (FWD) surveys.

The surveys are undertaken frequently to ensure accurate data is used for sealed surface and pavement modelling to develop renewal programmes to feed into the LTP cycle.

The surveys are based on the ONRC hierarchy with higher classifications having more complex and complete surveys undertaken.

30. Current Surface Age

- The average age for chipseal is **8.5 years**;
- The average age for TAC is **13.3 years**.

The asphalt five-year average annual achievement had been **1.6 km**, averaging the achievement at about **2.2%** / year, 45-year renewal cycle.
70% asphalt surfaces are >10 years old
20% are >20 years old,
50% will become >20 years if current cycle is continued.

Chipseal average annual achievement had been **24.3 km** (**6.1%/**year, **16.5-year** renewal cycle);

31. Current Pavement Age

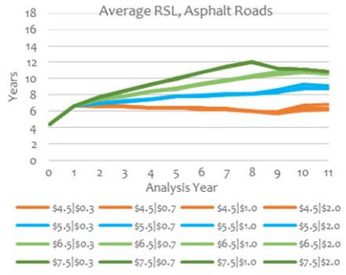
- The network average pavement age is **60 years**;
- 80% of the pavements have age older than **43 years**.

Over the past 5 years, the average annual achievement was **1.6 km (0.3%)** equating to approximately **316-year** renewal return period.

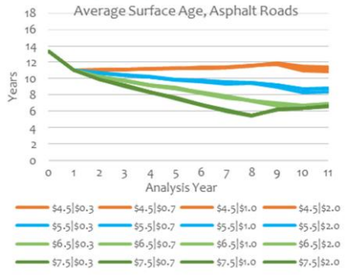
32. Predicted Condition

The network has been modelled using the existing budget increased by a range of percentages. High $7.5M to $4.5M Low for resurfacing with a mixture of HIGH $2.0M to $0.3M LOW of rehabilitations.

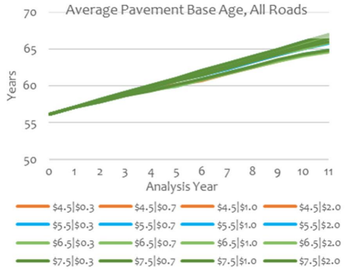
Surface Age Chipseal Pavement



Surface Age Asphalt Pavement



Pavement Age



Summary

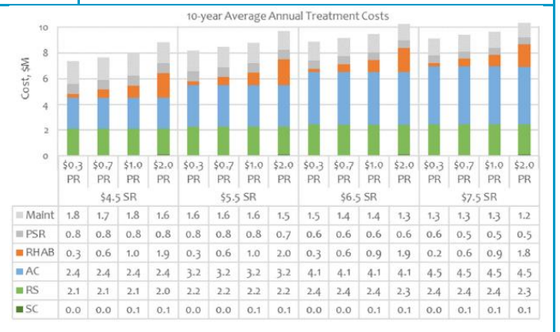
- The predicted chipseal surface age remains steady and near the current level throughout the analysis period for all optimised budget scenarios. This is because even at low budgets there is adequate funding to do chipseal. 28km per year at $2.4M being the optimised outcome
- The average chipseal age levels out at around 7-10 years regardless of the budget scenario
- The current average asphalt surface age (12 years at the completion of 2024/25) is maintained or improves when funding is $3.2 million or greater
- Pavement age will increase when there is less than approximately 8 km of base renewal done each year
- Increasing pavement age indicates the pavement capacity will inevitably be consumed over a long period of time. This is expected and demonstrates a trend similar to most road networks.

33. Forecast Programme

The adjacent table shows the budget for the model shown in the charts in Section 7.

The budget necessary to mange both surface life and the pavement age is $7.6M per annum.

This will deliver 1.5km of rehabilitation (similar average of the past 5 years), 4.5km of asphalt resurfacing and 28km of chipseal resurfacing.



	$0.3 PR	$0.7 PR	$1.0 PR	$2.0 PR	$0.3 PR	$0.7 PR	$1.0 PR	$2.0 PR	$0.3 PR	$0.7 PR	$1.0 PR	$2.0 PR	$0.3 PR	$0.7 PR	$1.0 PR	$2.0 PR
	$4.5 SR				$5.5 SR				$6.5 SR				$7.5 SR			
Maint	1.8	1.7	1.8	1.6	1.6	1.6	1.6	1.5	1.5	1.4	1.4	1.3	1.3	1.3	1.3	1.2
PSR	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.7	0.6	0.6	0.6	0.6	0.6	0.5	0.5	0.5
RHAB	0.3	0.6	1.0	1.9	0.3	0.6	1.0	2.0	0.3	0.6	0.9	1.9	0.2	0.6	0.9	1.8
AC	2.4	2.4	2.4	2.4	3.2	3.2	3.2	3.2	4.1	4.1	4.1	4.1	4.5	4.5	4.5	4.5
RS	2.1	2.1	2.1	2.0	2.2	2.2	2.2	2.2	2.4	2.4	2.4	2.3	2.4	2.4	2.4	2.3
SC	0.0	0.0	0.1	0.1	0.0	0.0	0.1	0.1	0.0	0.0	0.1	0.1	0.0	0.1	0.1	0.1

7.4 UNSEALED ROADS PAVEMENTS

7.4.1 Unsealed Roads Pavement Maintenance

Unsealed pavement maintenance includes the activities shown in the table below:

Table 7.25 Unsealed Pavement Maintenance

NZTA Work Category	Key activity	Sub-activity	Comment
112	Unsealed pavement maintenance	Grading	Programmed cyclic activity
		Spot metalling	Reactive maintenance
		High shoulder removal	Planned, based on inspections

Maintenance activity is described below. The overall strategy is to have a proactive and effective routine inspection and grading programme across the network which delivers the agreed levels of service.

Table 7.26 Unsealed Pavement Maintenance – Primary Types of Maintenance Activity

Work Type	Description
Inspections and monitoring	Inspections are hierarchy based ensuring faults are detected early (as they start to emerge) and, where appropriate, responses are actioned in a timely manner so that service levels are met continuously. The relatively short length of unsealed network enables close working knowledge of locations and issues by both staff and contractor.
Customer feedback	Feedback from residents and road users as recorded in the Requests for Service system is considered alongside faults data.
Prioritisation	Inspections identify drainage and other non-pavement defects, and provide inputs for prioritising the metalling actions in the optimum summer period.
Maintenance delivery – grading and reactive maintenance	The timing and frequency of grading operations is managed to ensure effective resource use and that the surface is fit for purpose. Grading in winter or mid-summer is sometimes problematic due to either very wet or dry surface conditions which inhibits optimal maintenance actions.
	The current contractor also has the adjacent authority's contract so with collaboration and coordination planned works are undertaken to maximise plant use which is reflected in the value for money tender. Grading is reduced in those areas when dust suppressant has been applied and typically graded out at the end of spring. Reactive maintenance is carried out to ensure the pavement remains safe to use and excessive deterioration does not occur – priorities are linked to ONRC and traffic levels.
Quarry pit	Council has had its own quarry pit for metalling materials at Awarua. This is utilised where appropriate for sourcing materials and ensures a value for money is available and can be measured against other pit material dependent on the road surface needs. This has ensured that market cost is delivered through the contract. The Awarua pit has a limited life and without expansion (and resource consenting approvals) this resource will be closed and material be purchased from the market. The costs of material are likely to rise. It could be that the price being paid by Council for its own material is too low and the actual cost of the service is higher than historically charged.

	Reinstatement costs at the current pit must be met by royalties from the materials taken, although historically are unlikely to meet the closing costs. Specialist qualifications and skills are needed to manage the quarry and this is contracted outside of council.
Dust suppressant including dust reduction trials	Dust suppressant is not provided or subsided by Council. Contractors can seek to apply approved materials (through a permit from Environment Southland) for sections of roads adjacent to houses. The materials utilised have been trialled and while some are helpful, no long term dust suppressant material is seen to be available. The consenting requirements and return from such investment are typically not such that an available solution is offered to the community at an acceptable price. The impacts of health and environmental factors will be likely to place greater pressures on the budgets and options for supressing dust. The use of solutions like Otto Seals and similar, whilst becoming more proven, have not been included as funded options for residents to access.
Subdivision planning	Many unsealed roads have had adjacent land development occur and some are now much more highly subdivided. This is one of the problems experienced in the demand for higher levels of service and response over a more rural environment. Future commentary on resource consents is likely to indicate that if the road is unsealed then the likelihood of dust and other atypical outcomes from living close to an unsealed road are highly likely to occur, and any decisions at purchase of properties need to understand this impact. Further planning consideration could be given at subdivision where the consent is a discretionary action.

A “one-page” summary relating to WC 112 and maintenance contract delivery is provided in Section 7.4.4.

7.4.2 Unsealed Roads Pavement Renewals

Table 7.27 Unsealed Pavement Renewals

NZTA Work Category	Key activity	Sub-activity	Comment
211	Unsealed road metalling	Re-metalling of surface layer – replacement of wearing-course aggregate	Programmed cyclic activity
		Pavement rehabilitation – restoring pavement strength	Programmed based on investigation and increased traffic loadings leading to road failure

In developing re-metalling schedules each year the following approach is taken, based on each road’s hierarchy and other factors:

Table 7.28 Unsealed Pavement Renewals – Primary Types of Renewal Activity

ONRC Class	Urban	Rural Re-metalling
Arterial or Primary	No urban unsealed roads	• Approach as per Secondary due to limited lengths
Secondary	No urban unsealed roads	• Field inspection • Review customer feedback frequency and type

		• Review previous years costs • Staff inputs • Check planned land use or heavy vehicle use changes • Review material sources and types (reduce dust) • Calculate metal net losses
Access	No urban unsealed roads	• Field inspection • Review customer feedback frequency and type • Review previous years costs • Staff inputs • Check planned land use or heavy vehicle use changes • Consider metal net losses
Access – Low Volume	No urban unsealed roads	• Check customer feedback and check if appropriate to LoS • Review previous years costs • Staff inputs on usage • Consider if alternative options (e.g. drainage) are more appropriate

7.4.3 Unsealed Roads Programme Evaluation

Programme Options

Unsealed roads typically carry low traffic volumes and maintenance other than grading is on a reactive basis. Re-metalling is treated as a renewal activity and current expenditure on maintenance is predominantly grading with a minor number of digouts.

Maintenance and renewal programme alternatives are:

- *Reduce Investment* – only renew on failure. This would see less re-metalling being done, in response to poor condition and safety concerns, mostly on a reactive basis with scheduled work only on busier roads.
- *Maintain Current LoS* – be predictive with good robust operational strategies and scheduled re-metalling, respond to faults "just in time", grading as per current cycles.
- *Improve Customer Experience* – this would involve renewing unsealed pavements with better quality surfaces such as Otta seals on a yearly programme.

Programme Evaluation

Only one maintenance option is considered appropriate, reflecting current practice.

Given the modest size of the renewal investment need (around $350,000) and the short network, the options have not been further evaluated at this time. Best asset practice suggests that *Maintain Current LoS* is the Optimum and is appropriate with different options not considered viable.

It is noted that some community areas are likely to seek improvements, this being an area where better policy and conversations are needed which could lead to changes in the future.

Recommended Programme

A summary short term maintenance forecast is described in the following table:

Table 7.29 Unsealed Roads Short Term Maintenance Forecasts ($000) – Not inflated)

WC Code	WC Description	Current 2023/24	Yr. 1 2024/25	Yr. 2 2025/26	Yr. 3 2026/27	Total 2024-27	Total 2021-24
112	Unsealed Pavement Maintenance	$226.0	$275.0	$275.0	$275.0	$825.0	$460.8

10 year forecasts are provided in the next table:

Table 7.30 Unsealed Roads 10 Year Maintenance Forecasts ($000) – Not inflated)

WC Code	24/25	25/26	26/27	27/28	28/29	29/30	30/31	31/32	32/33	33/34
112	$275.0	$275.0	$275.0	$275.0	$275.0	$275.0	$275.0	$275.0	$275.0	$275.0

A summary short term renewal forecast is described in the following table:

Table 7.31 Unsealed Roads Short Term Renewal Forecasts – Not inflated

WC Code	WC Description	Current 2020/21	Yr. 1 2021/22	Yr. 2 2022/23	Yr. 3 2023/24	Total 2024-27	Total 2021-24
211	Unsealed Road Metalling	$195.2	$360.0	$360.0	$360.0	$1080.0	$371.9

10 year forecasts are provided in the next table:

Table 7.32 Unsealed Roads 10 Year Renewal Forecasts – Not inflated

WC Code	24/25	25/26	26/27	27/28	28/29	29/30	30/31	31/32	32/33	33/34
211	$360.0	$360.0	$360.0	$360.0	$360.0	$360.0	$360.0	$360.0	$360.0	$360.0

7.4.3 Unsealed Roads Capital Development

There are no new assets anticipated over the life of the Plan. It is more likely that the length of the unsealed network will decline if seal extension works are carried out under Work Category 325.

Council is considered funding $2m ($400,000 per year for five years) for such projects through the Long Term Plan. This was deem unaffordable at this time and is to be consider for the next LTP. An option for seal extension could be partially or privately funded if Council were to develop a rating area and the residents in that area pay for development over time through a targeted rate.

Table 7.32 Unsealed Roads 10 Year Renewal Forecasts – Not inflated

WC Code	24/25	25/26	26/27	27/28	28/29	29/30	30/31	31/32	32/33	33/34
NA	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0

Council would consider each proposal on its merits. Council may decide to be supportive of some development, where they contribute to reducing impacts on the environment and or wider maintenance issues, or support better network utilisation or access.

7.4.4 Unsealed Pavements Activity – Story on a Page

The following “story on a page” provides comparative peer information, summary asset condition and management activities information, and summary recommended programmes for each category.

Unsealed Roads – Activity Management Plan

Background Information - **W/C 112 (Maintenance) and 211 (Renewals)**

Prepared By: Lesley McCoy	Approved By: Doug Rodgers	Date: 10/23	Revision 4

34. Contract Delivery

Contract 1167 – Roading Maintenance Contract

Contractor: Fulton Hogan Limited

35. Contract Objectives

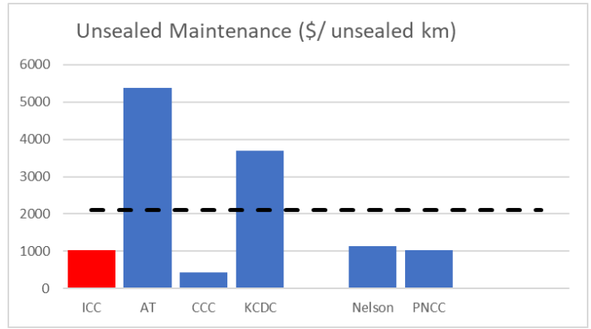
- To understand and develop strategies and have the resources to maintain the unsealed roading network, meeting both the customer and client expectation to a level of service which upholds the minimum, the existing condition.
- Develop and implement pro-active strategies to enable:
  - Early fault identification where possible and expedient response to identified faults
  - Selection (and where agreed) design of cost-effective remedial treatments that address the Network's needs
  - Timely completion of the contract works
  - Provision of accurate, timely asset information and documentation.
- Develop and implement innovative work methods and/or materials that result in enhanced performance and overall cost savings, providing reliable and long-term repairs for an extended period.

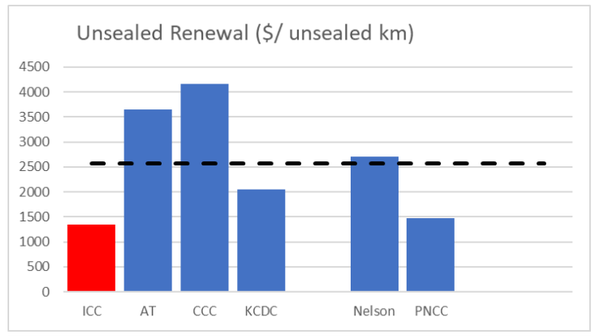
36. Customer Expectations

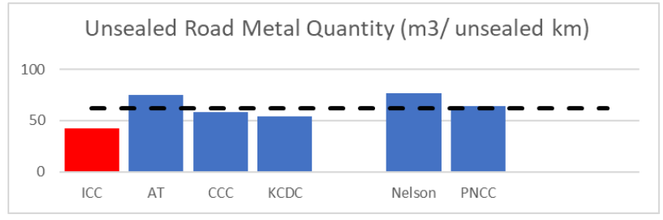
- Increase in customer expectations of the services provided.
  - Unsealed road customers seeking methods to improve their service. More pressure on provided levels of service which are Waka Kothai funded.
- Customer demands from residents on unsealed roads continue to grow with the desire to have less dust and a better road surface. The demand anticipated will be requests for additional seal extensions to occur.
- A challenge to manage in rural areas will be the dust issue from unsealed roads and how the health aspects are understood by customers.

37. Comparison with Peers

Not all the authorities in our peer group have unsealed roads but the following charts represent the comparisons where they exist.







38. Historical Expenditure

Maintenance costs are split between maintenance grading and minor maintenance tasks and metalling that is funded under the renewal category. The total expenditure for the approved three year block is shown in the table below:

Year	W/C 112 ($k)	W/C 211 ($k)
2018/19	$175	$150
2019/20	$179	$154
2020/21	$184	$158

39. Road Condition

Condition analysis of the unsealed road network through a low cost cell phone based roughness measurement tool the entire network is surveyed regulary. Findings were as follows:

- 71.2% of the network is good or satisfactory
- The mean roughness is IRI = 3.53 which represents a smooth network

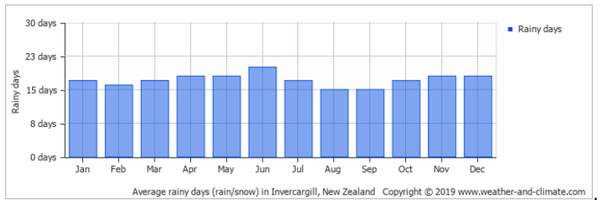
2022-07-01	-	2023-10-15
Road Condition (RC)	**Number of points**	**% of points**
Good	17863	48.6
Satisfactory	8297	22.6
Unsatisfactory	4765	13.0
Poor	5833	15.9
Mean value (eIRI)	3.53	
Total number of points	36758	
Total length (meters)	271833	
Points/meter	0.14	



40. Improvement Strategy

Seal Extension –A seal extension policy has been developed and checked against Waka Kotahi General Circular 16/04 and there are no roads that will be eligible for financial assistance for sealing. Therefore there are no demands on the limited unsealed roads funds to provide for seal extensions. They will only be possible if fully funded by Council or adjacent residents or as identified safety improvements using the low cost low risk funding category when there is clearly a safety risk.

Dust Mitigation – Council do not consider that dust is currently a significant problem for the unsealed road users or adjacent residents. Chemical based dust suppression application on a network wide basis is also expensive and only temporary and its effectiveness is reduced by rainfall. Invercargill rainfall is high in December and January when rain falls for more than 15 days on average.



Alliance Contract: The sealed and unsealed road networks have been combined for greater efficiencies in the Collaboration / Alliance style Road Maintenance Contract.

41. Aggregate Supply

New sources are required and while at this time there are no plans to consent the existing Awarua site. The search for a new site will have to commence in the near future to ensure that aggregate is available when required.

Aggregates may be blended to provide more suitable roading material so this will be considered if sources of sufficient standard are not able to be found.

The current metalling strategy is to apply "little and often" meaning a thin spread of wearing course and the roughness and condition rating indicating that this is currently an appropriate strategy.

42. Forward Programme

The maintenance contract will ended in 2022. The new contract rates are considered to be appropriate but have increased and have been tested throught he retendering process. Some provision for the increase has been made in the table below. Council included unsealed roads in the overall maintenance alliance contract, Council can set the level of expenditure and fit the maintenance work to get the correct level of service on the network.

Improvements to unsealed road drainage is also required to have a programme to create drains to remove water from the edge of roads and to also remove areas of high shoulder where water is trapped on the road surface.

W/C	24/25	25/26	26/27	27/28	28/29	29/30	2030-34	2034-38	2038-42	2042-46	2046-50
112 ($k)	$275	$275	$275	$275	$275	$275	$825	$825	$825	$825	$825
211 ($k)	$360	$360	$360	$360	$360	$360	$1080	$1080	$1080	$1080	$1080
NA	$0	$0	$0	$0	$0	$0	$2000	$900	$0	$0	$0

7.5 STRUCTURES

7.5.1 Structures Maintenance

Structures maintenance includes the activities shown in the table below:

Table 7.33 Structures Maintenance

NZTA Work Category	Key activity	Sub-activity	Comment
114	Structures maintenance	Minor deck repairs	Routine maintenance
		Handrail repairs	Routine maintenance
		Retaining walls maintenance	Routine maintenance
		Guardrail maintenance	Routine maintenance
		Other structures	Routine maintenance

This category includes culverts with waterway areas greater than 3.4 m^2 as well as other structures including guardrails, retaining walls, etc.

Bridges are relatively young in age and have low maintenance demands, this being reflected by structures in good condition. Historical expenditure on bridges has been relatively low and greater focus needs to be provided to ensure that good condition can be maintained. Through regular and minor attention bridges should have a long life delivering service at a high level.

Maintenance activity is described below.

Table 7.34 Structures Maintenance – Primary Types of Maintenance Activity

Work Type	Description
Inspections and monitoring	Regular bridge inspections are undertaken by experienced and suitably trained personnel looking to ensure the capacity and operation of the structure are not compromised. Waterway obstructions are also checked although this in most cases has not been an issue for Invercargill.
HPMV and 50-Max bridges	External consultants are used for evaluating HMPV and 50Max loads on bridges and these processes are aligned to the NZTA approach with data available to integrate with a national approach when such a service is available.
Managing restricted bridges	Five bridges have a weight and speed restriction and access issues are managed separately. The bridges are currently not planned to be upgraded but ongoing maintenance will keep them operational and the levels of weight restrictions regularly reviewed in light of their condition.
Tiwai Bridge	Tiwai Bridge is the biggest and most difficult structure and specialist assistance is used with this bridge. The piles are an area highlighted in previous surveys which need to have regular and detailed inspections. The piles are very tidal and difficult to inspect and repair. Planned interventions on a five yearly cycle are planned. As the bridge has a new deck, this area is relatively free from defects but will require ongoing observation as the environment is coastal and harsh.
Queens Drive (east) bridge	This bridge is situated on an Arterial route within Invercargill. Whilst being built in 1983, further detailed investigation (and possible repair) are needed to establish and then bring the bridge to a higher strength capacity due to the original design appearing to be much lower than anticipated.

Retaining walls	Council has recently identified areas in Bluff which should be classified as retaining walls and is gathering information for future consideration on these elements.
Guardrails	Most guard railing is associated with bridges given the flat terrain in Invercargill.

7.5.2 Structures Renewals

Table 7.35 Structures Renewals

NZTA Work Category	Key activity	Sub-activity	Comment
215	Structures components replacement	Deck replacements	Replacement of specific structure components, typically scheduled based on condition
		Structural piles	
		Retaining walls	
		Other structures	
216	Bridge and structures renewals	Replacement "like-for-like" of bridges and structures	Structures at end of serviceable life for condition reasons
322	Replacement of bridges and structures	Bridge improvements beyond "like-for-like" replacement	Structures which are structurally inadequate or have restricted capacity or waterway area
		Bridge widening	
		Retaining or sea wall replacement	

The renewal strategy and approach are described below:

Table 7.36 Structures Renewals – Primary Types of Renewal Activity

Renewal Action	Description
Overall strategy	The overall strategy for bridge and structure replacement is based upon end of economic life. Currently, short to medium-term needs are identified through the inspections programme with long-term projections being based on the asset valuation and remaining lives.
Weight restricted bridges	Existing bridges with weight restrictions are not planned to have strengthening undertaken. If demand changes, strengthening may be considered. These bridges will be actively managed with restrictions applied which are appropriate to condition and access needs. Currently no customer feedback has suggested that bridges are causing additional travel or concerns.
Condition based intervention	Structures will have regular expert condition assessments to observe condition. Intervention with heavy duty structural maintenance will be considered ahead of renewal where deterioration can be slowed.
Tiwai Bridge	This is an area where in previous investigations it was found that the best solution is to regularly inspect and repair pile structures. Given a new deck of life 100 years has been constructed, the options available for piles are either to do heavy duty maintenance and breakout cover concrete and repair as and when required, or install new piles and beams. Investment has been allowed for below.
Significant structures components replacement needs	A detailed bridge replacement strategy has not been developed as few replacements are predicted in the term of the plan. However, a number of significant investments are expected which are likely to be funded in this work category, including: • Year 1 – $500,000: Tiwai Bridge pile works • Year 5 – $500,000: Tiwai Bridge pile works

	• Year 10 – $500,000: Tiwai Bridge pile works
Full bridge replacement	When this is required the hierarchy and importance of the structure will be validated through a full business case approach with full replacement funded through WC 322. No replacements are scheduled here at present.

7.5.3 Structures Programme Evaluation

Programme Options

The general importance of structures to the network and the low level of maintenance funding does not warrant consideration of alternative options for maintenance.

The only renewal programme option considered relates to Tiwai Bridge. Various options have been considered as described above and the repair option proven to be most appropriate.

Programme Evaluation

No option consideration has been undertaken given the scale of expenditure planned over the next three years and the importance of bridges to the transport network, other than Tiwai Bridge, which has been fully assessed in previous plans.

Recommended Programme

A summary short term maintenance forecast is described in the following table:

Table 7.37 Structures Short Term Maintenance Forecast ($000) – Not inflated

WC Code	WC Description	Current 2023/24	Yr. 1 2024/25	Yr. 2 2025/26	Yr. 3 2026/27	Total 2024-27	Total 2021-24
114	Structures maintenance	$57.2	$150.0	$175.0	$175.0	$500.0	$74.2

10 year forecasts are provided in the next table:

Table 7.38 Structures 10 Year Maintenance Forecast ($000) – Not inflated

WC	24/25	25/26	26/27	27/28	28/29	29/30	30/31	31/32	32/33	33/34
114	$150.0	$175.0	$175.0	$175.0	$175.0	$175.0	$175.0	$175.0	$175.0	$175.0

A summary short term renewal forecast for component replacements is described in the following table:

Table 7.39 Structures Short Term Renewals Forecast ($000) – Not inflated

WC Code	WC Description	Current 2023/24	Yr. 1 2024/25	Yr. 2 2025/26	Yr. 3 2026/27	Total 2024-27	Total 2021-24
215	Structures components replacement	$51.5	$500.0	$70.0	$70.0	$640.0	$51.5

10 year forecasts are provided in the next table:

Table 7.40 Structures 10 Year Renewals Forecast ($000)

WC	24/25	25/26	26/27	27/28	28/29	29/30	30/31	31/32	32/33	33/34
215	$500.0	$70.0	$70.0	$70.0	$500.0	$70.0	$70.0	$70.0	$70.0	$500.0

7.5.3 Structures Capital Development

There are no new structures planned for construction by Council, and no significant structures anticipated as a result of subdivision vesting.

However, where justified, works that create new structures assets may be funded through the Resilience Improvements (WC 357) or Low Cost Low Risk Improvements (WC 341) categories described later.

7.5.4 Structures Activity Summary and Programme Needs

The following “story on a page” provides comparative peer information, summary asset condition and management activities information, and summary recommended programmes for each category.

Structures – Activity Management Plan

Background - W/C 114 (Maintenance) and W/C's 215, 322 (Renewals)

Prepared By: Lesley McCoy	Approved By: Doug Rodgers	Date: 10/23	Revision 7

43. Structures

Invercargill City Council owns a total of 55 bridges including three large culverts, with a total value of approximately $100.3 million (including ramps).

Culverts included under the schedule of bridges have a waterway opening greater than or equal to 3.40 m2 in accordance with Waka Kotahi policy.

Several bridges are on joint district boundary roads and replacement responsibilities are shared with the Southland District Council (SDC).

The following is the construction types of the bridges.

Type	No	Owner
Concrete Bridges	43	ICC
Culverts (>3.4m2)	3	ICC
Timber Bridges	6	ICC
Concrete Bridges	3	SDC / ICC
Underpass	5	Private

44. Current Network Condition

Tiwai Bridge is by far the longest and has the highest single proportion of the replacement cost. It is a 27 span bridge 491m in length with significant causeway accesses. The bridge has had significant repairs undertaken early in its life (30years) and had a full beams and deck renewal due to a deteriorated posttension slab which has cracked and failed.

The following are the longest five structures which represents 63% of the total length.

Name	Length (m)	ONRC	Year Built	Lanes	Remaining Life	Age	Expected Life
Tiwai Road	491	Secondary	1970	2	47	63	100
Dunns Road	174	Secondary	1987	2	64	36	100
Ferry Road	85	Access	1939	1	16	84	100
West Plains Road	61	Access	2002	1	49	21	70
Tweed Street North	56	Access	1972	4	49	51	100

Five bridges have speed and/or weight restrictions in place and these bridges are all on access low volume roads. External consultants are used for evaluating HMPV and 50Max loads on bridges and these processes are aligned to the Waka Kotahi approach with data available to integrate with a national approach when such a service is available.

Bridge inspections have been undertaken and in general not indicated any significant condition issues with the maintenance demands being relatively routine and minor. They are inspected on a regular basis by trained Council staff and general inspection every two years.

A number of the bridges are twin box culverts and were installed in the 1990's and are simplistic in design. Tiwai Bridge is a bridge where regular detailed inspections have been undertaken and with a new deck is in good condition. The piles on Tiwai are an area where ongoing monitoring and inspections are planned. Some repairs have been undertaken and forward inspect and remediate programme is budgeted. The Tiwai bridge repair approach has been reasonably well defined as earlier repairs have successfully detailed the methodology for undertaking this work.

45. Structures Maintenance

Structures maintenance includes the activities shown below:

W/C 114 – Structures maintenance

- Minor deck repairs
- Handrail repairs
- Retaining walls maintenance
- Guard rail maintenance
- Other structures routine maintenance

46. Bridge Maintenance Strategy

A 10-year maintenance plan created in 2023 following the annual inspections. The plan had a total value of identified upgrade and maintenance of $1.3M equating to an average spend of $130,000 per annum.

There are usually additional defects found during each round of inspections and they are added to the plan and prioritised by the Consultant.

The 2023 report identified that joints are a perpetual drain on resources and their durability can be increased significantly by avoiding chip-sealing over them. Regular communication with the Network Maintenance Contractor is necessary to achieve this.

47. Structures Renewals

Structures renewals includes the activities shown below:

W/C 215 – Structures components replacement

- Deck replacements
- Structural piles
- Retaining walls
- Other structures

W/C 322 – Bridge renewals

- Full replacement based on condition and age

48. Structures Strategy

Structures assets provide continuous all weather access across our regions rivers and streams and form a crucial part of the Invercargill City transportation network. Structures facilitate the easy movement of people and goods through the city and contribute significantly to a vibrant economy.

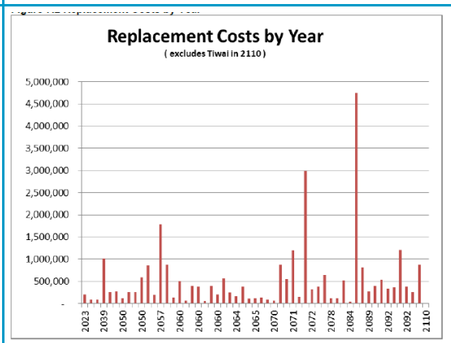
Structures also have a key function as a lifeline especially to communities and customers with limited alternative options. It is crucial the structures are maintained with Resilience in mind as consequences of under maintaining can be very expensive in both financial cost and user utility.

Structures will have regular expert condition assessments to observe condition. Intervention with heavy duty maintenance will be considered ahead of renewal where deterioration can be slowed.

When renewals are needed the hierarchy and importance of the structure will be validated through a full BBC approach.

49. Long Term Forecast

The long term forecast bridge replacement cost profile, based on the age profile and asset valuation lives, is as follows. Renewal activity is not expected to be significant until at least the 2040's and 2050's.



50. Forward Programme

Structures renewals are presented below based on the best knowledge available at the time. Any significant issues may be discovered during bridge inspections and the timing of works may change.

W/C	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030-34	2034-38	2038-2042	2042-2046	2046-2050
114 $(k)	$150.0	$175.0	$175.0	$175.0	$175.0	$175.0	$525	$525	$525	$525	$525
215 $(k)	$500.0	$70.0	$70.0	$70.0	$500.0	$70.0	$780	$280	$780	$780	$780
322 $(k)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0

7.6 KERB AND CHANNEL / DRAINAGE

7.6.1 K&C / Drainage Maintenance

Drainage maintenance includes the activities shown in the table below:

Table 7.41 Routine Drainage Maintenance

NZTA Work Category	Key activity	Sub-activity	Comment
113	Routine drainage maintenance	Water tables	Mix of cyclic and reactive
		Kerb and channel	Spot repairs based on inspections
		Culverts and sumps	Cyclic cleaning and reactive repairs
		Street cleaning	30% of programme – sweeping and cleaning

Maintenance activity is described below.

Table 7.42 Routine Drainage Maintenance – Primary Types of Maintenance Activity

Work Type	Description
Maintenance delivery – kerbs and channels	The current strategy for kerb and channel maintenance (both maintenance and renewal) is to target appropriate remedial repairs during preseal and renewal programmes. Investing at the right time to coordinate with other work and as part of a reseal programme delivers the best long-term solution. In some situations, it is clear that a repair in selected location makes sense but to replace 60% under a piecemeal repair may not be appropriate. Minor maintenance is identified and where it will cause further pavement damage or needs urgent attention, is programmed and undertaken to limit failure risks. All defect reporting highlights where there are successive repairs needed within a street length and assessment is undertaken as to whether repair or renewal is a more cost-effective solution.
Maintenance delivery – culverts and manholes	Culverts and manholes follow a similar functional approach as to when to repair or replace. They are inspected on a routine annual basis and cleared as required.
Maintenance delivery – water tables	Water tables are routinely observed through travel and defect reporting with forward programmes developed to ensure roads are well drained in the sometimes wet environment. Some areas are very flat, which is difficult to drain without forming ditches. Some rural areas which are well maintained and mowed by owners often lead to less than optimum water tabling but these are progressively being addressed. In recent years more focus has been on water tabling to improve drainage and this needs to continue to ensure the pavements have good drainage. There are sections of the network where drainage is adequate however some areas still need ongoing work. Vegetation is removed which allows ditches to function correctly. Some road side ditches are relatively deep and are listed as defects. Some ditches have unstable sides, such as in Otatara where ditches have a sand base and timber shoring. These structures are currently maintained as a Stormwater asset although the ditch also benefits the road. Culverts crossing the road are Roading responsibility.

Lifecycle economics	An observation relating to contract rates is that it is often more economic to undertake full renewals over many repairs as the establishment and other costs drive the process. It is not always intuitive but some renewals are more cost effective than repairs when the whole of life is considered. Often old kerbing was not constructed on a gravel base and as water enters, the organic or clay base loses supporting strength and failure risk increases. A repair in places does not correct enough of this in a section and only fixes the surface issue. The normal approach to options for these types of assets is experienced judgement as to whether a repair will last sufficiently long to get the asset through to the next significant activity such as a reseal or renewal. If it will without risking other issues, then a repair is undertaken.

7.6.2 K&C / Drainage Renewals

Table 7.43 Drainage Renewals

NZTA Work Category	Key activity	Sub-activity	Comment
213	Drainage Renewals	Kerb and channel replacement	Scheduled based on condition, remaining life and risk, and coordinated with other programmes
		Renewal of culverts and sumps	
		Reinstatement of roadside drains (ditches / water tables)	Scheduled based on condition, may be coordinated with resurfacing work

Some existing kerb and channel were laid at flat grades with practically no fall. This has resulted in water not flowing to sumps if any settlement or damage occurring, and this leading to early failure. These kerbing levels are often tied into both the road crossfall, and the footpath and boundary. At replacement the grade is corrected as best can be archived and some additional associated reinstatement works (often within the road to gain and tie into existing surfaces) is required. This adds additional cost as reflected in the above table.

Renewals Strategy

Table 7.45 K&C Historical Renewal Strategy

Renewal Action	Description
Kerbs and channels renewal	Replacement may include associated assets such as sumps. At the same time, the opportunity may be taken to improve stormwater drainage if there are deficiencies on the street. Where feasible, the work will be coordinated with footpath renewal or pavement resurfacing / rehabilitation work programmes and other utility works such as sewer, water or stormwater pipe renewals. If not, then there are additional costs associated with the restoration of footpaths, berms and carriageways disrupted by the K&C work. Kerb and channel renewal is a balanced consideration between the economics of undertaking short lengths and never having a long term asset (and pay higher rates) or accept that the best whole of life solution is a full renewal.
Culvert replacements	Culverts crossing roads are typically replaced on failure as complete lengths including headwalls where appropriate. Where renewals of pavements are planned, the culvert and other assets are reviewed, and where appropriate renewed and at times resized to meet the current design standards.
Water tables / roadside drains	If roadside drains need restoration due to the build-up of material restricting their function, this will be carried out through the maintenance programme above.

Developing the Forward Works Programme

The approach to developing the Forward Works Programme (FWP) for drainage renewal is as follows.

Table 7.46 Developing the Forward Works Programme

Task	Activities
Inspections	• Annual 100% surface water channel RAMM rating • Annual 100% drainage structures inspection • Assigned Condition Rating
Assess Remaining Life	This is based on: • Current Age • Material Type • Condition • Environmental Risk[35] (see figure below)
Populate / Update 10-year and 30-year FWP	• The programmes for renewal of hard assets over a 10-year and 30-year time frame are put together using the assessed remaining life for each asset – including drainage, footpaths and pavements. • The purpose of these programmes is to highlight the risk of spikes in upcoming renewal need and provide an indication of the needs-based future funding profile. • This method uses time blocks to allow for the fact that there is some uncertainty around the deterioration assumptions and remaining life: ○ Group assets into blocks – 0 to 3, 3 to 10, 10 to 20, 20 to 30 years

[35] Environmental Risk – based on areas of severity such as severe (e.g. coastal with regular inundation), moderate (e.g. wet areas, saturated ground) or benign (e.g. free draining)

	○ Quantify number of assets in each block ○ Multiply asset quantity by estimated cost of renewal ○ Divide the value for each block by number of years in that block to ascertain an average annual value
Develop 3-year and Annual FWP	• Detailed programmes are produced for the Annual Plan by taking sites which have been identified as being deficient or in need of repair / renewal and assessing risk to form a justification as outlined below: ○ Extract first 3 years of renewals from 10-year FWP - Sites with issues identified by routine / cyclic crews - Sites where carriageway improvements such as sealing or rehabilitation are planned – may drive drainage renewal - Sites associated with footpath renewal ○ Assess likelihood of asset failure and consequence: - Likelihood Factors (Asset Condition, Asset Environment) - Consequence Factors (Pavement and Surfacing damage, Flooding and Safety, Road Classification, Disruption and Detour Availability, Cost of Reinstatement) - Assign a Risk score based on table below ○ This will assist with prioritising sites within the Annual Plan if limited funding is available by ranking sites from highest to lowest score.

Estimated Remaining Life				
		Environmental Risk		
		Benign	*Moderate*	*Severe*
Condition Score	*1 - sound*	60 – 80 Years	50 – 60 years	40 - 50 years
	3 - moderate	30 - 40 years	20 – 30 years	10 – 20 years
	5 - poor	0 – 10 years	0 – 5 years	0 – 3 years

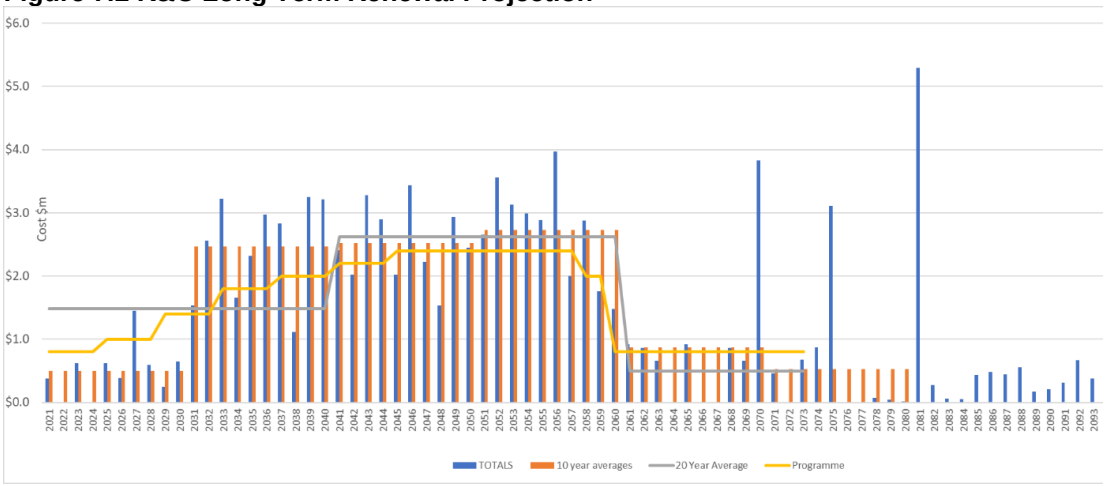
Drainage Priority Score				
		Likelihood		
		H	M	L
Consequence	H	9	7	5
	M	7	5	3
	L	5	3	1

Long Term Renewals Projection

A long-term projection of kerb and channel replacement using the FWP logic above is provided in the figure below. The recommended programme is the stepped orange line which increases significantly over the 30-year period to 2051. This reinforces the need to regularly monitor asset condition, and therefore remaining life, in order to obtain as much life as is prudent from the kerb and channel asset.

Note that criticality is addressed in the risk assessment process through the consequence rating. This process assigns higher priority for higher consequence failures – a reflection of the ONRC hierarchy and other importance factors relating to the road.

Figure 7.2 K&C Long Term Renewal Projection



7.6.3 K&C / Drainage Programme Evaluation

Assessment of Options

The MCA ranked the following options for drainage renewals in order of preference:

1. *Replace "optimal" lengths of assets,* e.g. full-length culverts, upgrading culverts when planned works are undertaken, whole street K&C sections or based on a set percentage requiring repairs rather than short-length "spot" renewals.
2. *Improve knowledge about condition and performance* to better inform renewal planning. More inspections and condition monitoring to help determine risk areas and develop predictive modelling capability.
3. *Base renewal response on ONRC hierarchy* – low volume roads are likely to deteriorate to a worse condition than other roads.
4. *Early replacement* – kerbing could be selected by age and / or condition based on hierarchy and replaced at higher budget levels. The consequence is a more aesthetic and appealing street environment, likely more footpath associated works, probably better and more effective drainage but higher cost. This would also potentially prevent a large demand (bow wave) in the future.
5. *Investigate rejuvenation trials* on aged concrete kerbs and channels.
6. *Run more assets to failure* and "spot repair" as and when needed. This is a reduced budget option and could be subject to hierarchy (as in 4. Above), and given the wide streets and low traffic volume could allow for some drainage failures affecting the pavement but not the traffic lanes. This would only impact on safety when the failure reached the traffic lane. The consequence would be higher rehabilitation costs due to much more extensive work areas.

The "current optimal" drainage management strategy involves making repairs regularly when drainage is compromised until full renewal is needed. It supports pavement renewal for appropriate hierarchy roads but for local roads may result in kerbs and channels lasting beyond their planned life. This is similar to the preferred strategy which is reflected in a combination of Options 1 and 3 above. It offers a balance between optimising lifecycle costs (including the adjoining pavement), risk management and aesthetics. It continues to deliver a programme at similar levels using the current programming approach.

In addition, Options 2 and 5 will be pursued through the **Improvement Programme**.

Option 4, while it offers lifecycle benefits, is less affordable and at this stage the benefits are not considered sufficient. This will be monitored however. Option 6 "run to fail" while more affordable in the short term has negative consequences and is not considered an appropriate option for this asset class.

The results of the MCA are shown below.

Recommended Programmes

A summary short term maintenance forecast is described in the following table:

Table 7.47 Kerb and Channel / Drainage Short Term Maintenance Forecast ($000) – Not inflated

WC Code	WC Description	Current 2023/24	Yr. 1 2024/25	Yr. 2 2025/26	Yr. 3 2026/27	Total 2024-27	Total 2021-24
113	Routine drainage maintenance	$343.0	$420.0	$420.0	$420.0	$1,260.0	$1,370.6

10 year forecasts are provided in the next table:

Table 7.48 Kerb and Channel / Drainage 10 Year Maintenance Forecast ($000) – Not inflated

WC	24/25	25/26	26/27	27/28	28/29	29/30	30/31	31/32	32/33	33/34
113	$420.0	$420.0	$420.0	$420.0	$420.0	$420.0	$420.0	$420.0	$420.0	$420.0

A summary short term renewals forecast is described in the following table:

Table 7.49 Kerb and Channel / Drainage Short Term Renewals Forecast ($000) – Not inflated

WC Code	WC Description	Current 2023/24	Yr. 1 2024/25	Yr. 2 2025/26	Yr. 3 2026/7	Total 2024-27	Total 2021-24
213	Drainage renewals – K&C replacements& Culverts	$1,131.1	$1,120.0	$1,120.0	$1,120.0	$3,333.0	$3,005.0

10 year forecasts are provided in the next table:

Table 7.50 Kerb and Channel / Drainage 10 Year Renewals Forecast ($000) – Not inflated

WC	24/25	25/26	26/27	27/28	28/29	29/30	30/31	21/32	32/33	33/34
213	$1,120.0	$1,120.0	$1,120.0	$1,120.0	$1,261.0	$1,261.0	$1,661.0	$1,661.0	$1,661.0	$1,661.0

Figure 7.3

PBC Multi Criteria Option Analysis, RCA: Invercargill City Council

Activity/Work Categories: Drainage (WC)

Short list up to 3 options from the following:

No.	Option - Can we make	Yes/No	Rank	Reason
1	❑ Intervention response **timing** change	Yes	3=	Early replacement based on age, condition and ONRC hierarchy
2	❑ **LoS** adjustments			
3	❑ Use existing assets **differently**			
4	❑ **Blending** Work Categories differently			
5	❑ **Risk** - Hold Assets longer	Yes	6	Run more assets to failure and repair as and when needed.
6	❑ Managing **demand**			
7	❑ **Route** Management			
8	❑ Alternative approaches – different **solutions/technology**	Yes	5	Investigate trials on rejuvenation of aged concrete kerbs and channels
9	❑ **Maintenance vs Renewal** adjustments	Yes	1=	Replace longer lengths of assets at a time - e.g. full culverts, whole street K&C sections
10	❑ **ONRC** Classification variance	Yes	3=	Base renewal response on ONRC hierarchy - low volume roads likely to deteriorate to worse condition than other roads.
11	❑ Extended **temporary** management			
12	❑ **Supply chain** improvements			
13	❑ Improve **systems and capability**	Yes	1=	Improve knowledge about condition and performance to better inform renewal planning. More inspections and condition monitoring to help determine risk areas. Develop predictive capability.

Criteria	Weighting (Importance) (Total to 100%)	How good is this option: Option 1 - early replacement		Option 5 - run to failure		Option 8 - rejuvenation trials		Option 9 - longer renewal lengths		Option 10 - ONRC varg condition LoS		Option 13 - improve knowledge and capability			
		Raw	Score	Raw	Score	Raw	Score	Raw	Score	Raw	Score	Raw	Score	Raw	Score
Contribution to community outcomes and/or strategic objectives	10%	2	0.2	-1	-0.1	1	0.1	2	0.2	2	0.2	2	0.2		0
Effectiveness in addressing ICC problem statements and achieving investment benefits	20%	3	0.6	1	0.2	1	0.2	2	0.4	2	0.4	2	0.4		0
Impact on road safety outcomes	10%	1	0.1	0	0	0	0	1	0.1	1	0.1	0	0		0
Impact on levels of service including ONRC related	10%	2	0.2	-1	-0.1	1	0.1	2	0.2	1	0.1	0	0		0
Impact on risk e.g. asset failure, reputational risk	15%	2	0.3	-2	-0.3	1	0.15	2	0.3	0	0	2	0.3		0
Impact on asset preservation and "whole of life" cost outcomes	15%	2	0.3	-1	-0.15	1	0.15	2	0.3	1	0.15	2	0.3		0
Community affordability	15%	-3	-0.45	2	0.3	2	0.3	-1	-0.15	2	0.3	1	0.15		0
Environmental impacts	5%	0	0	0	0	1	0.05	0	0	0	0	0	0		0
			0		0		0		0		0		0		0
Totals	100%		1.25		-0.15		1.05		1.35		1.25		1.35		0

7.6.3 K&C / Drainage Capital Development

New drainage assets are created through subdivision and associated development or through the Council's capital works programme. This includes projects which upgrade or improve an existing asset beyond its existing capacity or performance in response to changes in service needs or customer expectations.

Where justified, new drainage assets may be funded through the Resilience Improvements (WC 357) or Low Cost Low Risk Improvement (WC 341) categories described later.

7.6.4 K&C / Drainage Activity Summary and Programme Needs

The following "story on a page" provides comparative peer information, summary asset condition and management activities information, and summary recommended programmes for each category.

Drainage – Activity Management Plan

Background Information – W/C 113 (Maintenance) and 213 (Renewals)

Prepared By: Lesley McCoy		Approved By: Doug Rodgers	Date: 10/23	Revision 6

51. Contract Delivery

Expenditure under the Drainage work categories is either as part of Contract 1167 – Road Maintenance or included in separate renewal contracts.

5. Objectives for Drainage

The purpose of this asset is to provide adequate drainage for water runoff from the carriageway, protect the road edge and substructure from stormwater intrusion and provide a protective barrier for pedestrians from passing traffic.

The drainage systems represents a significant risk to the transportation network, where the cost of repairing the consequences of failure generally far exceed the value of the asset causing the failure.

52. Historical Expenditure

Invercargill has 213km of kerb and channel older than 60 years old out of a total of 544km

There are 4835 sumps and over 730 culverts

Replacement is currently "driven" by the pavement and footpath renewal programme.

The total expenditure for the previous three year block is shown in the table below:

Year	**W/C 113** $(k)	**W/C 213** $(k)
2020/21	$314	$1,189
2021/22	$485	$1106
2022/23	$542	$684

53. Current Network Condition

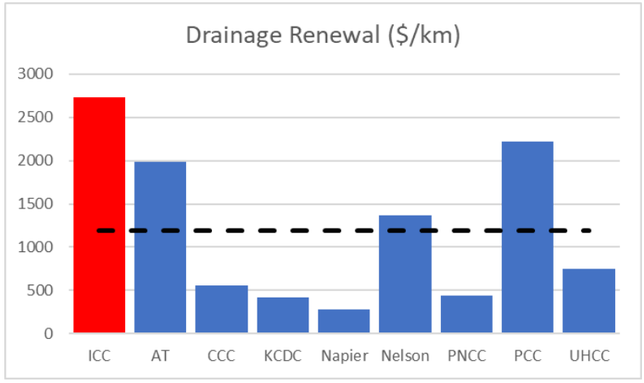
Kerb and channel assets are inspected during our annual pavement ratings surveys. These surveys record the number and type of defects present in the kerb and channel, but do not assign a condition rating. We use the overall ratings for the whole pavement to derive the condition of kerbs and channels, based the information we use to select sections of pavement for renewal or rehabilitation.

We inspect culverts and inlets/outlets during planned and reactive maintenance and keep a record of our observations to assist or justify further repairs works or renewal.We do not formally capture condition ratings on the RAMM asset inventory for kerb and channel assets or culvert and inlet/outlet assets.

Typical defects include; lack of waterproofing, damage from heavy vehicles, ponding due to inadequate grade, or deterioration arising from weak materials and/or construction deficiencies.

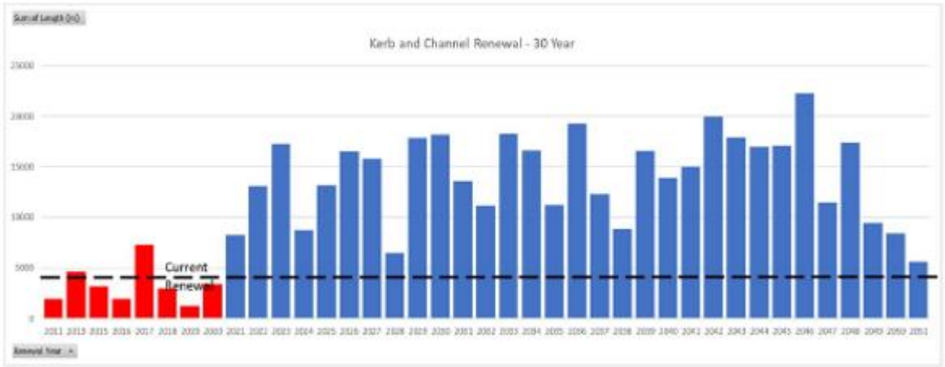
54. Comparison with Peers

Routine drainage maintenance is km are less than the average of our peer group but the volume of drainage renewals undertaken due to the high resealing and rehabilitation programmes is the highest cost per kilometre among our peer group but when combined together is $3433/km. Similar to Auckland Transport and Porirua City so may reflect how other TLA's in our peer group treat maintenance and capital differently.



55. Drainage Renewal Demand

There has been an under investment in kerb and channel which based on asset life shows a backlog, this programme need to be investigated and put into the improvement programme



6. Renewal Options

Options for renewal include:

- Undertake only minimal repairs as and when needed
- Replace whole sections where appropriate
- Replace whole street block when repairs in block would be over 25%
- Repair short sections of culverts where actual failure occurs
- Replace full culverts on failure
- Develop predictive response to repairs based on condition inspection
- Upgrade culverts when planned works are undertaken

Kerb and channel renewal is a balanced consideration between the economics of undertaking short lengths and never having a long term asset (and pay higher rates) or accept that the best whole of life solution is a full renewal.

7. Renewal Strategy

Kerb and Channel – the renewal strategy for kerb and channel is based on:

1) The pavement renewals programme (where required) together with field observations on the network base on the ONRC classifications.
2) Preseal and all defects reporting, asset condition and age information to establish need. If it is the most economic method.
3) Condition rating baseline information from RAMM.
4) Other asset renewals such as footpaths.

Culverts – are typically renewed when:

1) Inspection failure reports are received or
2) When aligned to other rehabilitation projects or resurfacing activities.

Renewal of kerb and channel is considered where the operational condition has deteriorated, and pavement or footpath renewals are planned and the kerbing is unlikely to remain operational for the lifecycle of the associated asset. In such cases the renewals are coordinated to provide a longer life for all assets and avoid early adjacent renewals being needed. Some kerbing has insufficient grade to be effective and timing of renewals are considered when adjacent work is occurring.The network is relatively short and by developing forward programmes the knowledge of the condition held by staff can be fed in and recorded against current and forward programmes so that this understanding is available in decision making. The improvement plan below will attempt to systemise this process and to enable knowledge transfer.

8. Improvement Programme

Strategy: Develop a strategic approach to drainage. This consists of an asset data review, taking a treatment length (TL) approach to the drainage asset which allows a more targeted treatment programme. These TLs will be condition rated and undergo an algorithm which assess the environment (rain fall, soil type) and various defect data (all faults). Prioritisation will look at risk and consequences using ONRC pavement classification groups

Alternative Method: With over 177km of the kerb and channel being over 60 years old some of that kerb and channel is still serviceable and just looks old with exposed aggregate. A trial will be considered to see if any alternative treatments to full replacement such as epoxy coating can restore the serviceability for a much lower over-all cost with minimal restoration required

9. Forward Programme

Due to the pressure on the overall budget we will attempt to manage Drainage renewals (W/C 213) within the current budget allocation and prioritise the available funds.

W/C	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030-2034	2034-2038	2038-2042v	2042-2046	2046-2050
113 $(k)	$420.0	$420.0	$420.0	$420.0	$420.0	$420.0	$1,680	$1,680	$1,680	$1,680	$1,680
213 $(k)	$1,120.0	$1,120.0	$1,120.0	$1,120.0	$1,261.0	$1,261.0	$7,044	$8,444	$9,244	$10,044	$10,044

7.7 FOOTPATHS AND CYCLEWAYS

7.7.1 Footpaths and Cycleways Maintenance

Table 7.51 Footpaths and Cycle Path Maintenance

NZTA Work Category	Key activity	Sub-activity	Comment
124	Cycle path maintenance	Spot repairs – e.g. patching, potholes	Operation and maintenance of the pavement and facilities associated with cycle paths, including the operation of associated lighting
		Maintenance of associated facilities[36]	
		Environmental maintenance[37] of paths	
		Routine care of drainage facilities	
125	Footpaths[38] maintenance	As for Cycle paths above	Maintenance of public footpaths and facilities associated with footpaths; including pedestrian network connections, stairs, alleyways and off-road connections

Maintenance activity is described below:

Table 7.52 Footpaths and Cycle Path Maintenance – Primary Types of Maintenance Activity

Work Type	Description
Inspections and monitoring	Similar all defect inspections are undertaken as to Pavements and the data recorded in RAMM. Safety is the key priority for inspections.
Customer feedback	This is the most useful source of input, and response is aligned with the all defects programmes.
Impact of service authorities and other deterioration causes	Footpath deterioration is a gradual process but is accelerated by other service utility works and repairs, vehicle damage or by tree roots. Damage which is easily observed is most often caused by outside agencies, and options of small repairs are viable and are undertaken in preference to full replacement in an unplanned manner.
Maintenance delivery – urban streets	Maintenance is delivered in conjunction with pavement maintenance. Urban footpaths do not have planned sweeping unless a specific issue is identified.
Maintenance delivery – CBD	CBD footpaths are regularly swept (six times a week). Repairing minor faults in the CBD is more regularly and aggressively undertaken due to the high foot traffic and the type of use (i.e. high heels footwear).
Maintenance delivery – vehicle crossings	Vehicle crossings are a key access point for properties and a high wear location and most prone to fail. Maintenance is often targeted to just repairing a crossing if the remaining footpath is in sound condition and these actions extend the asset life before a full renewal is needed.
Condition rating	Paths are independently condition rated every five years to assist with future renewal programmes but this also assists to highlight immediate maintenance issues.

[36] Associated facilities may include signs, markings, traffic signals, lighting, handrails / guardrails, etc
[37] Environmental maintenance not directly associated with roadways, including litter collection and vegetation management where vegetation would impede safe access and use
[38] Related to the transport function only

7.7.2 Footpaths and Cycleways Renewals

Table 7.53 Footpaths and Cycleways Renewals

NZTA Work Category	Key activity	Sub-activity	Comment
224	Cycle path renewals	Renewal of existing cycle paths and associated facilities	Programmed works
		Renewal of any associated drainage, structures and bridges	
		Renewal of path lighting assets	
225	Footpaths renewals	Replacement of existing footpaths with concrete	Programmed works
		Renewal of associated assets as for cycle paths	

Renewal Strategy

Footpaths are to be replaced with 100mm concrete when renewed. The only potential issue with this strategy could be the carbon emission of concrete vs asphalt which will be considered in the life of this plan.

The renewal strategy and approach that applies to both footpaths and cycle paths are described below:

Table 7.54 Footpaths and Cycleways Renewal Strategy

Renewal Action	Description
Renewal strategy	• Closely monitor condition through inspections from all defect reporting. • Only consider areas where the UFB cabling has been completed. • Footpath condition has deteriorated and reached a point where maintenance is not economically viable. • Consider when associated other renewals significantly impact heights of kerbing and impractical to undertake reasonable reinstatements. • Address any safety impacts such as uneven surfaces or older surfaces (both AC and concrete) being slippery. • Actively look to extend lives beyond the valuation lives through monitoring and some minor repairs. • Replace just crossings where footpath sections are acceptable. • Ensure each street has one footpath at least of rated condition above average. • Only renew one footpath in low use areas. • Identify acceptable risks but acknowledge that unspent budget will be placed in a renewal reserve.
Material selection	Footpaths are generally replaced in concrete unless they are outside businesses or schools or need a full frontage area replaced. Concrete has been accepted as the more effective surface material, based on cost and life. Carbon emission are soon to be added to this criteria.

Footpaths width	Footpaths are replaced from a 1.5m wide path to a 1.8m in concrete. Concrete is now 100mm thick and is performing well compared to the thinner paths historically at 75mm thick.
Footpaths location	Footpaths are replaced away from the kerb if possible to allow for refuse bins and limit damage due to parking vehicles on them.

7.7.3 Footpaths and Cycleways Programme Evaluation

Assessment of Options

The MCA ranked the following options for footpaths and cycle paths maintenance and renewals, in order of preference:

1. *Optimal renewals programme.* This option increases the renewals budget to address current and anticipated condition and age issues, while also holding maintenance to the minimum necessary.
2. *Improve capability*. Complete inventory stock-take and conduct systematic, consistent condition evaluation to inform renewal planning.
3. *Improve LoS*. Invest in new capital improvements for footpaths and cycleways to improve LoS, provide for mode separation, improve safety, and address service gaps and service perception issues.
4. *Route / hierarchy management*. Develop hierarchies for footpaths and cycle paths to form the basis for investment over time (NOF approach).
5. *Risk – hold assets longer*. Address only high risk (safety concerns related to asset deterioration) footpaths and cycleways based on criticality – this will result in more short-term ageing and deterioration. This would see less focus on renewals, but there would need to be an increase over time.

The consequences and implications of adopting a “do minimum” renewals option is a large future renewal cost which, unless funded, would be hard to deliver and pay for. Assets could become piecemeal and difficult to renew as there would contain both new and old sections.

On the other hand, an “over-funded” investment approach would see assets replaced too early and before they have reached their end of life. Given the funding needed by Council overall this is not appropriate.

In association with the preferred renewal approach above, maintenance can be minimised within the following guidance:

- If the footpath is beyond 75% of asset life, do holding repair only to make safe and programme for renewal 5-year cycle.
- Do only safety issues (basic small quantities) maintenance and invest in renewals 1 to 2-year cycle.

This means a strategy of *minimal repairs* when the life is well consumed and then to manage that section with appropriate safety repairs whilst it is programmed for renewal. This is consistent with Council’s desire to take a higher risk approach in funding footpath activities.

As communicated in previous plans, footpaths has been an area where Council has full visibility and has accepted that a higher risk approach is appropriate. To date, funding for renewals has been accepted as being below the long-term average replacement cost (depreciation) and Council has shown a willingness to allow the condition profile to change over time. However, that situation is changing and as can be seen in the “bow-wave” diagram on subsequent pages, an adjustment is considered necessary in the short-term.

Of note is that as demographics and demands change, increased expectations for renewed or additional footpaths can be expected. However, the current approach has been to limit investment. As the rate of change in condition of a footpath is relatively slow it can be monitored at low risk allowing some adjustment in the rate of ramping up the renewal programme.

A net debit fund is available with uncommitted budget savings to allow for any sudden unexpected demands. Ongoing monitoring of demand will be considered in the improvement plan but is not anticipated to have a medium-term impact.

The preferred approach therefore involves a combination of Options 1 to 4 above, and in particular a proactive renewal programme. Options 2, 3 and 4 will be progressed as part of the **Improvement Plan**, with Option 5 not being favoured due to its low MCA score.

A copy of the MCA is provided below:

Figure 7.4

PBC Multi Criteria Option Analysis, RCA: Invercargill City Council

Activity/Work Categories: Footpaths and Cycleways (WC 124, 125)

Short list up to 3 options from the following:

No.	Option - Can we make	Yes/No	Rank	Reason
1	❑ Intervention response **timing** change			
2	❑ **LoS** adjustments	Yes	3	Invest in new capital improvements for footpaths and cycleways to improve LoS, provide for mode separation, improve safety, address service gaps and service perception issues
3	❑ Use existing assets **differently**			
4	❑ **Blending** Work Categories differently			
5	❑ **Risk** - Hold Assets longer	Yes	5	Address only high risk (safety concerns related to asset deterioration) footpaths and cycleways based on criticality - this will result in more short term ageing and deterioration, but increase renewal programme more gradually over time.
6	❑ Managing **demand**			
7	❑ **Route** Management	Yes	4	Develop hierarchies for footpaths and cyclepaths to form the basis for investment over time (NOF approach)
8	❑ Alternative approaches – different **solutions/technology**			
9	❑ **Maintenance vs Renewal** adjustments	Yes	1	Increase renewals programme now to address condition and age, while holding maintenance to the minimum necessary
10	❑ **ONRC** Classification variance			
11	❑ Extended **temporary** management			
12	❑ **Supply chain** improvements			
13	❑ Improve **systems and capability**	Yes	2	Complete inventory stocktake and conduct systematic, consistent condition evaluation to inform renewal planning

Criteria	Weighting (Importance) (Total is 100%)	How good is this option: Option 2 - improve LoS through new capex		Option 5 - safety risk focus only		Optoin 7 - develop hierarchies		Option 9 - increase renewals to address condition and age		Option 13 - improve data and renewal decision process					
		Raw	Score	Raw	Score	Raw	Score	Raw	Score	Raw	Score	Raw	Score	Raw	Score
Contribution to community outcomes and/or strategic objectives	10%	3	0.3	-1	-0.1	2	0.2	3	0.3	2	0.2		0		0
Effectiveness in addressing ICC problem statements and achieving investment benefits	20%	3	0.6	1	0.2	2	0.4	3	0.6	3	0.6		0		0
Impact on road safety outcomes	10%	2	0.2	1	0.1	0	0	2	0.2	0	0		0		0
Impact on levels of service including ONRC related	10%	2	0.2	0	0	1	0.1	1	0.1	0	0		0		0
Impact on risk e.g. asset failure, reputational risk	15%	1	0.15	-2	-0.3	1	0.15	1	0.15	2	0.3		0		0
Impact on asset preservation and "whole of life" cost outcomes	15%	0	0	-1	-0.15	0	0	3	0.45	3	0.45		0		0
Community affordability	15%	-2	-0.3	3	0.45	1	0.15	-2	-0.3	-1	-0.15		0		0
Environmental impacts	5%	1	0.05	0	0	0	0	0	0	0	0		0		0
			0		0		0		0		0		0		0
Totals	100%		1.2		0.2		1		1.5		1.4		0		0

Recommended Programme

A summary short term maintenance forecast is described in the following table:

Table 7.55 Footpaths and Cycleways Short Term Maintenance Forecast ($000) – Not inflated

WC Code	WC Description	Current 2023/24	Yr. 1 2024/25	Yr. 2 2025/26	Yr. 3 2026/27	Total 204/27	Total 2021-24
124	Cycle path maintenance	$133.0	$285.0	$285.0	$285.0	$560.5	$333.5
125	Footpaths maintenance	$294.5	$345.0	$345.0	$345.0	$927.0	$757.3

The increase in cyclepath maintenance is due to the ability to assist with the Te Araroa trail maintenance.

10 year forecasts are provided in the next table:

Table 7.56 Footpaths and Cycleways 10 Year Maintenance Forecast ($000) – Not inflated

WC	24/25	25/26	26/27	27/28	28/29	29/30	30/31	31/32	32//33	33/34	34/35
124	$285.0	$285.0	$285.0	$285.0	$285.0	$285.0	$285.0	$285.0	$285.0	$285.0	$285.0
125	$345.0	$345.0	$345.0	$345.0	$310.0	$310.0	$310.0	$310.0	$310.0	$310.0	$310.0

A summary short term renewals forecast is described in the following table:

Table 7.57 Footpaths and Cycleways Short Term Renewals Forecast ($000) – Not inflated

WC Code	WC Description	Current 2023/24	Yr. 1 2024/25	Yr. 2 2025/26	Yr. 3 2026/27	Total 2024/27	Total 2021-24
224	Cycle path renewals	$0.0	$200.0	$100.0	$100.0	$400.0	$0.0
225	Footpaths renewals	$765.0	$2,728.0	$2,100.0	$2,100.0	$6,938.0	$3,072.9

10 year forecasts are provided in the next table:

Table 7.58 Footpaths and Cycleways 10 Year Renewals Forecast ($000) – Not inflated

WC	24/25	25/26	26/27	27/28	28/29	29/30	30/31	31/32	32/33	33/34
224	$200.0	$100.0	$100.0	$100.0	$100.0	$100.0	$100.0	$100.0	$100.0	$100.0
225	$2,738.0	$2,100.0	$2,100.0	$2,000.0	$1,600.0	$1,600.0	$1,600.0	$1,600.0	$1,600.0	$1,600.0

39

7.7.3 Footpaths and Cycleways Capital Development

Table 7.59 Footpaths and Cycleways Improvements

NZTA Work Category	Key activity	Sub-activity	Comment
451	Walking Facilities	New construction	Capital projects
452	Cycling Facilities	New construction	Capital projects

Acquisition of Assets

Footpaths and cycle paths are acquired as a result of:

- Extensions constructed by Council in areas where no footpath previously existed.
- Vesting footpaths constructed during subdivision development.

[39] Need to reviewed with Waka Kotahi co-funding is understood – Financial Bid Forecast 149

- Upgrading work to improve the level of service (particularly in relation to special treatments, e.g. paving blocks in high profile commercial areas).

The Council's development strategy is to only extend the network where demand or development of adjacent properties occurs.

Minimal footpath development is planned for each year as some existing gravel footpaths may get upgraded as properties are built or footpath connections between existing paths are required.

Footpath extensions are ranked using the following criteria (in order of importance):

- Pedestrian safety
- Pedestrian generators – schools, shops, etc
- Road hierarchy
- Operating speed of adjoining road, as indicated by speed limit

Where justified, new assets may be funded through the Low Cost Low Risk Improvement (WC 341) category described later.

The active mode transition required will identify areas within the existing network where the expectations (in particular safety) are not being met. These gaps or deficiencies will be prioritised, typically via LCLR and funded as and when budgets are available.

Other works likely are to better manage cycling on State Highways (primarily SH6) or within the city centre. Again these works will be funded via LCLR.

Council would like to investigate the potential to improve safety and place for the Ōtātāra Community, this could include development of footpaths, streetlights and ditch improvements. Staff will investigate these for inclusion in the 2027 Roading Asset Management Plan.

7.7.4 Footpaths and Cycleways Activity Summary and Programme Needs

The following "story on a page" provides comparative peer information, summary asset condition and management activities information, and summary recommended programmes for each category.

Footpaths and Cycleways – Activity Management Plan

Background - W/C 124 (Cycleways) & 125 (Footpaths)

Prepared By: Lesley McCoy	Approved By: Doug Rodgers	Date: 10/23	Revision 6	.

56. Contract Delivery

- The purpose of **footpaths** is to provide a safe and effective network, catering for the transportation and recreation purposes of pedestrians (and associated contrivances which are not vehicles).
- Pedestrian access ways provide a safe, convenient and defined means for pedestrian movement alongside and linking roadways.
- The purpose of **cycle ways** is to provide an efficient and safe network of cycle lanes and facilities to encourage the use of cycles as a viable mode of transport.

These activities are delivered as part of Contract 1167 – Sealed Road Maintenance by Fulton Hogan.

57. Historic Expenditure

The total expenditure for the approved three year block is shown in the table below

Year	W/C 124 $(k)	W/C 125 $(k)	W/C 225 $(k)
2021/22	$14	$168	$954
2022/23	$186	$294	$1,353
2023/24*	$133	$295	$765

*Forecast Sept 2023

58. Customer Expectations

Key issues related to footpaths and cycleways include:

- Safety of pedestrians, including friction/conflict between different types of users
- Identifying and prioritising routes for accessibility
- Urban character and streetscape design
- Increased public expectations over time creating greater demand for network extension and higher quality footpaths. The aging population is a factor in this.
- Continuity of cycle lanes throughout the cycle ways network as they are quite often disjointed near intersections and carriageway pinch points
- Rural cycling circuits with insufficient width, large size chip seals etc, which can make cycling difficult and hazardous
- Clearing of detritus from cycleways

59. Comparison with Peers

Funding for footpath maintenance was first introduced in the GPS in 2018. An overall increase in funding for this activity class which supports expansion to include footpath maintenance funding to improve walking and cycling facilities. The variation in our peer group depended on the amount previously being invested in footpath maintenance and the desired levels of service. The 2018-21 programme was the first to include funding from the National Land Transport Programme.

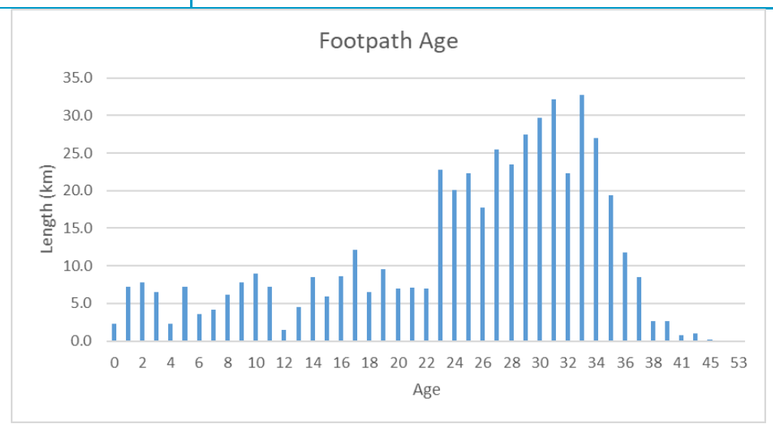
Our Peer Group have a wide variation in the Condition assessment of footpaths. Auckland Transport undertakes regular inspections and surveys using automated data and video capture devices covering the whole network. Condition surveys primarily assess the visible footpath faults present on the network; specifically, footpath cracks, trip hazards, skid resistance, surface roughness and deterioration.

Palmerston North City has developed an improved system for monitoring footpath standards. It is based on IPWEA (Institute of Public Works Engineering Australasia) Footpath Condition Rating Standard, and will be much more robust way of measuring and prioritizing footpath maintenance and renewals.

Invercargill City footpaths are surveyed typically every five years with council staff undertaking more frequent reviews in the other years where needed, of the lowest condition footpaths to assess if they have changed category.

60. Footpath Asset

Council has decided not to renew footpaths at the rate of consumption (or depreciation) and accept the risk of increased footpath renewals being required in the future. To match consumption 12.5km of footpaths should be renewed annually. This is aging the network and will require a larger investment in the future to manage the backlog being created now.



61. Management Strategy

Safety Focus – Poor footpath condition contributes to increased occurrence to trips and falls and provide unstable surface for mobility scooters. National and local statistics tell us that fewer people are cycling and they are cycling less often. This may be due to the perception that cycling is unsafe, unattractive or inconvenient. These perceptions are a barrier to cycling being chosen more often as a transport choice.

There also a strong correlation between the public perception of safety and uptake of cycling. People's perception of safety is noted as a more important determinant of uptake than the actual risk of injury. In addition, cyclists perceived that some level of separation from other traffic improved safety. A key driver for maintenance intervention is usually trip hazards. These faults also contribute to high percentage of complaints from stakeholders.

62. Improvement Programme

Hierarchy: Develop ONF categories / hierarchy to determine minimum standards adjacent to schools and shopping areas. The design of footpaths should be in accordance with the Waka Kotahi Pedestrian Planning and Design Guide.

Strategy: Develop a strategic approach to footpath upgrades. This consists of an asset data review, taking a treatment length (TL) approach to the footpaths which allows a more targeted treatment programme. These TLs will be condition rated and undergo an algorithm which assess the overall priority based on other factors including trip generators such as schools and shops. Prioritisation will look at risk and consequences using a hierarchy based on ONRC pavement classification groups.

Speed: Implement network management to reduce operating speed and risk areas

63. Forward Programme

Work needs are identified following condition rating surveys, routine inspections and follow up visual inspections. Council is planning to maintain the current level of expenditure as condition trends are not showing any significant worsening of overall condition.

W/C	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030-2034	2034-2038	3038-3042	3042-3046	2046-2050	2050-2054
124 $(k)	$285.0	$285.0	$285.0	$285.0	$285.0	$285.0	$1,104	$1,104	$1,104	$1,104	$1,104	$1,104
125 $(k)	$345.0	$345.0	$345.0	$345.0	$310.0	$310.0	$1,240	$1,240	$1,240	$1,240	$1,240	$1,240
224 $(k)	$200.0	$100.0	$100.0	$100.0	$100.0	$100.0	$400	$400	$400	$400	$400	$400
225 $(k)	$2,738.0	$2,100.0	$2,100.0	$2,000.0	$1,600.0	$1,600.0	$6,400	$6,400	$6,400	$6,400	$6,400	$6,400

7.8 TRAFFIC SERVICES

7.8.1 Traffic Services Maintenance

Traffic services maintenance includes the activities shown in the table below. This section includes railway level crossings maintenance. These devices provide motorists with appropriate warning of railway crossings and the presence of trains.

Table 7.60 Traffic Services Maintenance

NZTA Work Category	Key activity	Asset Type	Sub-activity	Comment
122	Network Services Maintenance	Signs	Regulatory, information, warning, street name blades	Maintenance, repair
		Delineation	Painted markings	Planned frequency
			Edge marker posts	Maintenance, repair
		Railings	Sight rails	Maintenance, repair
		Traffic islands	Various sizes (including medians)	Maintenance, repair
		Traffic signals	Poles, aspects, lamps, controllers, etc	Mix of reactive and planned
		Street lighting	Poles, brackets, lanterns maintenance	Mix of reactive and planned
			Electricity supply	District-wide supply Contract
123	Network Operations	Traffic signals, traffic control systems, VMS, TOC, LATMS	Operation, maintenance and electricity costs for traffic signals and other traffic management equipment and facilities	
131	Railway Level Crossing Warning Devices		Maintenance of signs, bells and lights where fitted, located at level crossings and lying within the Crown's rail corridor	

Maintenance activity is described below. The overall strategy is to achieve a balance between being predictive through surveys and reactive through customer requests.

Table 7.61 Traffic Services Maintenance – Primary Types of Maintenance Activity

Work Type	Description
Inspections, monitoring and audits – signs, delineation, railings, etc	Regular routine inspections using the RAMM database are undertaken to ensure traffic signs and street name blades are in operational condition, have not been vandalised or removed, or are at the wrong or inappropriate height. Surveys including night observations are undertaken to ensure visibility remains appropriate. Inspections are being aligned to ONRC measures, an improvement proposed in this Plan.
Customer feedback	RFS are monitored and responded to as faults are reported.
Signs – maintenance	Signs are a large number of small asset value and maintenance versus renewal is on a case by case basis. Most maintenance is a realignment of the sign but if it is damaged, it is renewed. Repairs are undertaken when the supporting

	brackets are damaged but if the sign or its surface is damaged, they require replacement. Take into account the outputs of signs surveys and inspection processes as described above.
Markings	General condition observed by the Maintenance contractor with special attention to high wear areas such as limit lines. Annual painted remarking or more frequently if required – see Renewals. Rural edge marker posts and other markers maintained to ensure continuity. Initiate night time retroreflectivity testing to identify deficiencies for treatment.
Railings – maintenance	Maintain painted surfaces to ensure visibility. Monitor condition and maintain assets replacing unsound components.
Streetlighting maintenance – lanterns	Street lighting is maintained by a the Road Maintenance Contract and is managed through RAMM contractor. Lamps are replaced historically on failure rather than end of operation life hours but with new LED the need to routinely inspect is diminished, other than cleaning if required. The frequency of maintenance with LED is less and savings have been built into the programme over the prior 3-year period.
Streetlighting maintenance – poles	Most streetlight poles are owned by Council and there is an agreed demarcation point at the pole fuse. This is where responsibility for the supply cables changes to the network electricity company. Concrete poles need a higher inspection regime and a baseline observation has been carried out alongside the LED installation. Future checking of steel poles will be required and techniques are now becoming available which will detect corrosion in underground sections and assist with maintenance and asset lives.
Traffic signals – maintenance	Traffic signals are maintained by a standalone contractor and managed through RAMM. The contract requires quarterly checks of the installations.
Railway Level Crossing Warning Devices	Planned and reactive works relating to barrier arms, signs, bells and lights where fitted, located at level crossings and lying within the Crown's rail corridor. Costs associated with the maintenance and renewal of rail level crossing warning devices are shared with rail track authority that manages the assets.

7.8.2 Traffic Services Renewals

Table 7.62 Network Services Renewals

NZTA Work Category	Key activity	Sub-activity	Comments
222	Network Services Renewals	Road delineation, lighting, signs	Mostly carried out under Maintenance
		Painted markings	Scheduled work
		Streetlighting replacement – poles, lanterns, etc	Scheduled work
		Traffic signals, traffic management equipment and facilities	Scheduled work

The need for the programmed renewal of these assets is largely determined through the monitoring and inspection processes described above. Renewal activities are listed below:

Table 7.63 Network Services Renewals – Primary Types of Renewal Activity

Renewal Activity	Description
Signs and Railings	Signs and delineation assets are typically replaced on a one-off basis as part of Maintenance, e.g. when damaged.
Markings	Road markings are inspected and programmed and remarked in zones. Weather is a major factor in having this work undertaken and often evenings are utilised during the summer months. Winter months prove to be difficult to undertake this work. Ensuring markings are in good condition is important to road safety as it is vital that limit lines at intersections are in good reflective condition at all times. Ensuring contractors deliver the approved programmes has been problematic in past years.
Street Lighting	Replacement of poles and brackets with structural deficiencies or in association with lighting upgrades. Replacement of failed luminaires is a maintenance activity. Council has had an 11 year programme to bring the network close to compliance with ANZS 1158.
Traffic Signals	Replace when performance becomes unreliable, on a condition basis or when obsolete: • Compatibility and serviceability, an issue particularly for Controllers and Pedestrian Push Buttons. • The manufacturer's life cycle and any subsequent support that is to be provided, including the availability of parts. • LED lanterns will require some replacements in the future as LED are now ageing.

7.8.3 Traffic Services Programme Evaluation

Assessment of Options

Given the importance of this asset group to road safety outcomes, no consideration of programme alternatives that are lower than at present have been considered.

The recommended maintenance and renewal programmes are similar to the current level of funding. The level of investment in maintenance is relatively low as the category includes operational costs such as power consumption which is a significant part of the budget. This is seen as a low risk area but potential for development.

Further improvement in understanding asset condition and the rate of change in condition could be developed and better long-term solutions developed. Historically however, the balance of renewal and maintenance has not been a significant performance issue. For example, as signs or traffic signals deteriorate, they are replaced when the LoS falls below acceptable but before failure occurs.

LED street lighting renewals are assumed to have been completed and the electricity costs whilst reduced in consumption, remain at a similar charging approach from Network companies for line charges.

Recommended Programme

A summary short term maintenance forecast is described in the following table:

Table 7.64 Traffic Services Short Term Maintenance Forecast ($000) – Not inflated

WC Code	WC Description	Current 2023/24	Yr. 1 2024/25	Yr. 2 2025/26	Yr. 3 2026/27	Total 2024-27	Total 2021-24
122	Traffic services maintenance	$787.8	$815.0	$815.0	$815.0	$2,445	$2,192.8
123	Operational traffic management	$111.1	$125.0	$133.0	$135.0	$393.0	$322.8
131	Level crossing warning devices	$30.3	$30.0	$30.0	$75.0	$135.0	$74.3

10 year forecasts are provided in the next table:

Table 7.65 Traffic Services 10 Year Maintenance Forecast ($000) – Not inflated

WC Code	24/25	25/26	26/27	27/28	28/29	29/30	30/31	31/32	32/33	33/34
122	$815	$815	$815	$815	$815	$815	$815	$815	$815	$815
123	$125	$133	$135	$135	$135	$135	$135	$135	$135	$135
131	$30	$30	$75	$120	$120	$30	$30	$30	$30	$30

A summary short term renewals forecast is described in the following table:

Table 7.66 Traffic Services Short Term Renewal Forecast ($000) – Not inflated

WC Code	WC Description	Current 2023/24	Yr. 1 2024/25	Yr. 2 2025/26	Yr. 3 2026/27	Total 2024-27	Total 2021-24
222	Traffic services renewals	$545.4	$875.0	$570.0	$670.0	$1,325.0	$1,780.5

10 year forecasts are provided in the next table:

Table 7.67 Traffic Services 10 Year Renewal Forecast ($000) – Not inflated

WC	24/25	25/26	26/27	27/28	28/29	29/30	30/31	31/32	32/33	33/34
222	$875	$570	$570	$670	$670	$670.0	$670.0	$670.0	$670.0	$670.0

It should be noted that annual road remarking are categorised as a renewal. These are currently backlogged and require investment in the first year of the plan.

7.8.3 Traffic Services Capital Development

New traffic services assets are created through subdivision and associated development and through the Council's capital works programmes.

Additional assets may be installed where a specific need is identified, such as:

- As a result of safety audit or network inspections, e.g. lack of signage or delineation where there is a safety risk or potential for road user confusion.
- Conversion of intersection control to traffic signals, possibly due to network operating changes.
- New variable speed signage for new schools.
- Other forms of electronic information, such as variable messaging signs.
- Crash barriers where a safety hazard exists and to minimise crash risk.

Where justified, projects that create new traffic services assets may be funded through the Low Cost Low Risk (WC 341) category described later.

7.8.4 Traffic Services Activity Summary and Programme Needs

The following “story on a page” provides comparative peer information, summary asset condition and management activities information, and summary recommended programmes for each category.

Traffic Services – Activity Management Plan

Background – W/C 122 & 123 (Maint & Ops) and 222 (Renewals)

Prepared By: Merv Gunn	Approved By: Russell Pearson		Date: 10/23	Revision 1.

64. Overview

There are separate maintenance contracts for street lighting, traffic signals and the balance of the assets mainly signs, roadmarking and other traffic facilities are carried out under Contract 1167 Sealed Roads Maintenance.

Street lighting provides lighting on streets for safe and efficient movement of vehicles, cycles and pedestrians and contributes to general security. LED bulbs have now been installed on the full network saving on power costs and they have a longer life.

Traffic signals provide traffic control facilities at major road intersections to reduce the potential for crashes and optimise the flow of traffic. They also regulate, guide and warn traffic including pedestrians. Their effectiveness depends on their design, maintenance, and construction. It also depends on effective coordination between signals using SCATS, and correct interpretation and timely reactions by road users.

Traffic signs provide guidance, delineation, warning, direction and information that is easy to see and understand and contributes to the safety and efficiency of the roading system.

65. Historical Expenditure

Traffic Services covers several different areas.

The total expenditure for the past three years is shown in the table below but the actual expenditure for 2018/19 is made up of:

- Traffic Services Power Supply - $498,183
- Carriageway Lighting Maintenance - $94,993
- Road marking Maintenance - $9,856
- Signs and other Traffic Services - $186,939
- Traffic Services Renewals - $269,833
- Balance of the costs are Professional Services

Year	W/C 122 $(k)	W/C 123 $(k)	W/C 222 $(k)
2020/21	$722	$118	$583
2021/22	$634	$100	$605
2022/23	$770	$111	$630

66. Customer Expectations

- Reinvestment may be required to address changing needs (e.g. mobility) and expectations (e.g. active modes) of the community will contribute to improved outcomes for the customers.
- Growth in the movement of people and goods on key corridors will result in increasing travel time unreliability during peak periods. This will lead to the need for capacity improvements at intersections including with changed traffic control eg. Stop control to Roundabout, constructed under the Low Cost Low Risk funding category.
- Driver behaviour and other factors are resulting in an increasing accident rate. Customers expect a focus on reducing deaths and serious injuries through investment in safer infrastructure and safer road use.

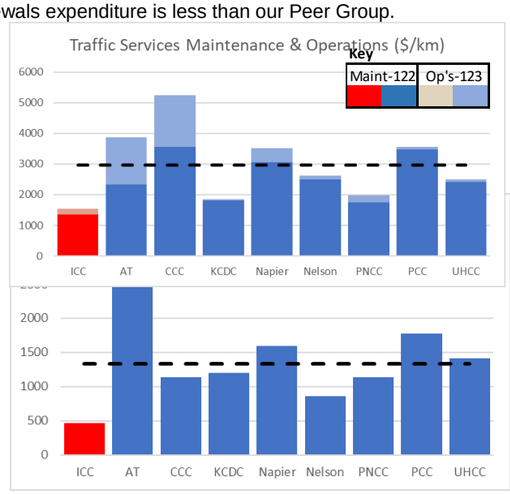
67. Comparison with Peers

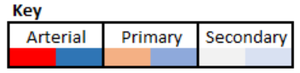
Traffic Services Maintenance and Renewals expenditure is less than our Peer Group.

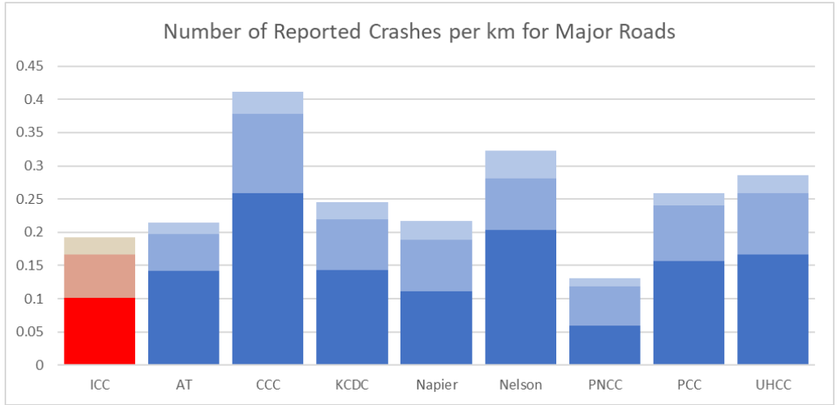
Traffic Services is the principal activity that relates to road safety. Invercargill compares well in comparison to our peers on a crash per kilometre basis and the image below shows the accident rate for Arterial, and Primary and Secondary Collector Roads.

Invercargill has one of the highest intersection crash rates in the country (relative to vehicle kilometres travelled) due to a combination of some unsafe road layouts and poor driving.

There is scope to investigate a targeted increase in Traffic Services expenditure to improve overall network safety performance.







68. Condition Assessment

In general, we assess the condition of traffic services assets during maintenance and inspections. We plan repairs and renewals based on these observations:

- **Street Lighting** - There is limited age and condition data available for street lighting. Information is collected about our poles, lanterns and fittings during maintenance works in order to better predict the long term future renewals profile.
- **Traffic Signals** - The physical condition of traffic signals is monitored via the SCATS system and via three monthly checking as part of the traffic signals maintenance contract.
- **Traffic Signs** - The key criteria for effective performance of traffic signs are visibility (affected by cleanliness and obstruction due to vegetation and, at night, reflectivity), and readability (influenced by letter size and style and location).

69. Managing Delivery

Street Lighting – Historically, the standard of street lighting has not been clearly documented. Independent Transpower audits have identified some issues with the database. The general strategy behind the replacement programme was to upgrade to a higher and more uniform standard. The recent LED lantern upgrade project has provided an opportunity to also renew the associated fittings and equipment.

Traffic Signals – Signal renewals are driven by condition, changing national standards, and performance monitoring. Crash reduction studies can also identify inadequacies in the layout, phasing or operation of signal installations.

Traffic Signs – Signs are generally maintained in a reactive manner. The main reasons signs fail are deterioration, accidental damage and vandalism. We inspect the condition of signs during general maintenance and any renewal requirements are noted and actioned. There may also be service requests raised to renew signs following reports by the public.

Roadmarking – Previously delivered as a stand-alone contract but temporary improvements have been noted with roadmarking being included in Contract 1167 – Sealed Road Maintenance.

Road Safety – Participation in strategic safety projects with partners is important to address region wide targets.

Strategy: Develop a strategy for road risk management including speed management through localised traffic design

Speed: Implement network management to reduce operating speed and risk areas

70. Improvement Options

Options for improvements to the delivery of traffic services:

- Install regulatory signs on both sides of roads and if required on a splitter island.
- On identified black spots consider a programme of pavement warning devices to alert driver of approaching intersection.

71. Improvement Programme

Waka Kotahi are investigating the installation of red-light cameras on signalised intersections on the State Highways in Invercargill. This has the potential to significantly improve driver behaviour at intersections and stop red light running.

It may be possible to do similar with a portable camera on major local roads

72. Forward Programme

To ensure the network condition is safe, fit-for-purpose and meets customer satisfaction targets we will need to continue to maintain traffic services at the same level as the approved 2021-24 NLTP budgets during the 2024-27 NTLP and beyond. The proposed 2021-24 NLTP values and the 10-year inflated forecast for expenditure on traffic services maintenance are shown in the table below.

The 2024-27 NLTP values include tan increased budget in the first year to allow for a backlog in road marking on the network.

W/C	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030-2034	2034-2038	2038-2042	2042-2046	2046-50
122 $(k)	$815	$815	$815	$815	$815	$815	$3,260	$3,260	$3,260	$3,260	$3,260
123 $(k)	$125	$133	$135	$135	$135	$135	$540	$540	$540	$540	$540
222 $(k)	$30	$30	$75	$120	$120	$30	$2,680	$7,180	$6,625	$5,940	$5,125

7.9 ENVIRONMENTAL MAINTENANCE AND RENEWAL

7.9.1 Environmental Maintenance

The purpose of this activity is to control vegetation growth and remove litter / rubbish within the road corridor in order to:

- Preserve safe line of sight for motorists and other road users
- Protect assets from damage caused by excessive vegetation growth
- Maintain a reasonable level of roadside amenity
- Prevent public health risk
- Prevent road hazard risk

The activities are described in the following table:

Table 7.68 Environmental Maintenance

NZTA Work Category	Key activity	Sub-activity	Comment
121	Environmental Maintenance *(includes Vegetation control and Litter Collection)*	Weed spraying	Urban and rural roads – 2 sprays planned
		Mowing	Rural road berms – planned frequency four times per annum, urban areas as specified
		Tree trimming	Rural – infrequent and responsive
		Minor slips clearing	Infrequent and responsive
		Snow and ice gritting	Infrequent and responsive
		Litter control	Rural roadsides – generally reactive
		Vegetation	LS provision

7.9.2 Environmental Renewals

Table 7.69 Environmental Renewals

NZTA Work Category	Key activity	Sub-activity	Comment
221	Renewals of specific asset types	Stock truck effluent facilities, catch fences, stormwater run-off treatment facilities	Programmed works

There are currently no programme activities for this work category.

7.9.3 Environmental Maintenance Programme Evaluation

Programme Options

Given the relatively low level of expenditure and the importance of the activity for safety reasons, there are no proposed options for comparison.

Programme Evaluation

No alternative options have been considered.

Recommended Programme

A summary short term maintenance forecast is described in the following table:

Table 7.70 Environmental Maintenance Short Term Forecast ($000) – Not inflated

WC Code	WC Description	Current 2020/21	Yr. 1 2024/25	Yr. 2 2025/26	Yr. 3 2026/27	Total 2024-27	Total 2021-24
121	Environmental Maintenance	$302.9	$490.0	$490.0	$490.0	$1,470.0	$922.9

10 year forecasts are provided in the next table:

Table 7.71 Environmental Maintenance 10 Year Forecast ($000) – Not inflated

24/25	25/26	26/27	27/28	28/29	29/30	30/31	31/32	32/33	33/34	34/35
121	$490	$490	$490	$490	$490	$490	$490	$490	$490	$490

7.9.3 Environmental Maintenance Activity Summary and Programme Needs

The following “story on a page” provides comparative peer information, summary condition and management activities information, and recommended programme.

Environmental Maintenance – Activity Management Plan

Background Information - **W/C 121**

Prepared By:	Approved By: Russell Pearson		Date: 10/23	Revision 5

73. Contract Delivery

This activity provides for the routine care and attention of the road corridor to maintain safety, aesthetic and environmental standards. Eligible activities include

- Vegetation control
- Litter collection on rural roads
- Removing graffiti from road structures
- Sweeping loose chip from intersections
- Removal of abandoned vehicles

These activities are delivered as part of Contract 1167 – Road Maintenance by Fulton Hogan

74. Historic Expenditure

The total expenditure for the approved three year block is shown in the table below.

Year	**W/C 121** $(k)
2020/21	$289
2021/22	$261
2022/23	$333

75. Customer Expectations

Four ONRC measures are linked to environmental maintenance activity:

- Sight distance
- Roadside obstructions
- Aesthetic faults
- Activity contributes to overall network cost.

Vegetation control by spraying is contracted to be delivered twice per annum in Spring and Autumn.

Mowing is specified by the desired standard that depends on location and is an all year round activity. Traffic Island are maintained to a high standard with grass not able to exceed 70mm in length.

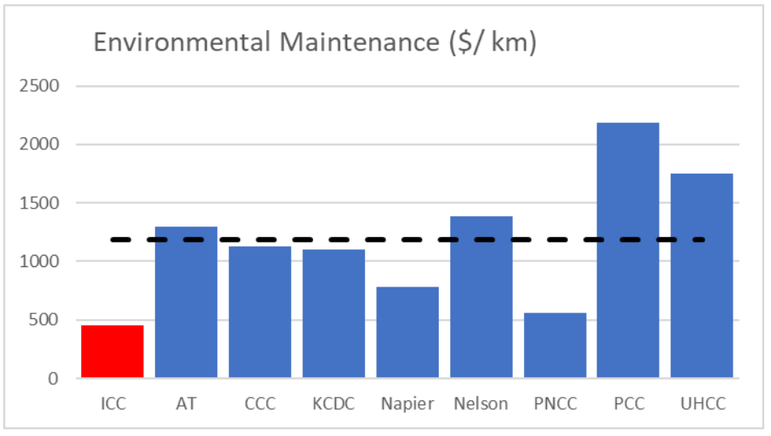
76. Comparison with Peers

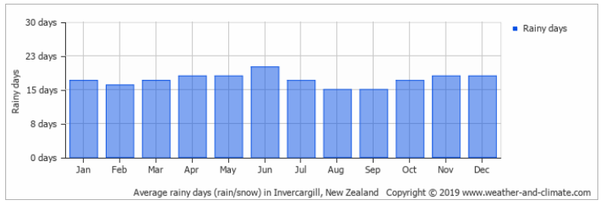
Expenditure on environmental maintenance is the lowest of our peer group with only Palmerston North City Council about the same on an expenditure per kilometre basis.

A part of this reason for this underspend is the maintenance cost of the planted traffic islands and all street trees are the responsibility of the Parks Department and undertaken without financial assistance.

This expenditure, apart from flower gardens and other aesthetic treatments, could be added to the current expenditure as the activity is eligible for financial assistance. The parks maintenance team can be a nominated sub-contractor of the road maintenance contractor to ensure expenditure is eligible.

Under a possible future Alliance Contract model allowance should be made to meet and improve customer level of service.





77. Current Network Condition

There are some concerns with the standard of vegetation control with increasing number of complaints about the maintenance standard:

- Invercargill weather over the summer is not as dry as many other locations and vegetation growth is sufficiently high over the summer that condition in channels and paths is well outside specified levels when the autumn spraying period begins in February
- Rural vegetation control is also not meeting standards with some spray resistant vegetation present on the roadsides.

78. Management Strategy

Maintenance and Operations – Current maintenance regimes take a pro-active stance to maintenance, both on a response basis, and forward programmed work. Gardens within high profile and usage areas such as the Central Business District tend to be of a higher quality and are maintained to higher standards than urban areas by the Council Reserves department from the Reserves cost centre. Reactive maintenance is generally in response to customer enquiries, referrals, or complaints, and is recorded through the RFS system, which documents and tracks response times to the action identified. Much of the reactive maintenance undertaken is in response to individual customer complaints and weather events.

Budget – The forecast budget for environmental maintenance has been derived and increased from historic costs which have been established as not being sufficient to carry out these activities these have been amended as necessary to allow for changes in management activities, practices and contract pricing. The forecast for maintenance expenditure is based on assessments that:

- The overall condition of the network will not change significantly over the next 15years
- Vegetation renewal strategies will increase and continue to target asset condition and network priorities based on age and condition.
- There will be no extension to the berm and garden network
- The level of maintenance required will not increase substantially reflecting an no increase in the overall condition and efficiency of the berm and garden network have increased significantly and require more funding as a result of maintenance and asset renewal cost of programmes.

Climate - Invercargill does not experience the dry summers that other Council's further north do, and twice annual spraying appears to be insufficient to manage vegetation growth for a full twelve months, it have been budgeted to increase to three sprays. Invercargill rainfall is high in December and January when rain falls for more than 15 days on average.

79. Maintenance Options

Consider options for delivery that will optimise the delivery cost including:

- Removal of planting (e.g. cabbage trees) that can contribute to long term increased maintenance in areas where by removing it will increase more vision for road users and less distribution by quicker maintenance e.g. lane closure now becomes a mobile operation
- Combine spraying and mowing where and when appropriate to reduce impact on the customer

80. Improvement Programme

INVERCARGILL	**Maintenance Intervention Strategy**: Develop a Vegetation Control Strategy to manage the delivery of vegetation control in the maintenance contract.
INVERCARGILL	**Methodology and Materials**: Reconsider urban and rural spraying methodology to provide a better all-round level of service. Mechanical treatment of shoulders could also be trialled.
INVERCARGILL	**Alliance Contract**: If an Alliance style contract is chosen for the Road Maintenance Contract has greater scope to ensure best for network delivery with actual cost reimbursement targeting an improved level of service.

81. Forward Programme

An increase of $50k per annum has been allocated to address the current unsubsidised activity and to allow an extra spray round each year.

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W/C	**2024/25**	**2025/26**	**2026/27**	**2027/28**	**2028/29**	**2029/30**	**2030-34**	**3034-2038**	**2038-2042**	**2042-2046**	**2046-2050**
121 $(k)	$490	$490	$490	$490	$490	$490	$1,960	$1,960	$1,960	$1,960	$1,960

7.11 CARPARKING

7.11.1 Carparking Maintenance

Table 7.72 Carparking Maintenance

Work Category	Key activity	Sub-activity	Comment
NA – Unsub	Carparking maintenance	Meter poles and head	Routine maintenance

On street carparking maintenance is provided within the sealed pavement areas. Kiosks are maintained when damage is observed or when they are emptied of money or through customer reports.

7.11.2 Carparking Renewals

Table 7.73 Carparking Renewals

Work Category	Key activity	Sub-activity	Comment
NA – Unsub	Carparking renewals	Meter poles and heads	Programmed work

Pavements in carparks are funded through this activity and will be managed in similar ways to road pavements but are expected to have longer lives.

Existing gravel off street carparks will be improved to a sealed surface standard over time and where value can be delivered.

Parking equipment will be updated as technology changes, approximately ten years which is likely to be the life of the technology.

7.11.2 Carparking Programme Evaluation

Programme Options

Pavement renewals for carpark will be evaluated at the time to consider the most acceptable solution.

Programme Evaluation

There are no alternative programmes to consider.

Recommended Programme

Maintenance budgets have made allowance for updated technology and some improvements to the surfaces of off-street carparks. Options for maintenance expenditure have not been developed as the current investment is reactive and considered appropriate.

Table 7.74 Carparking Short Term Maintenance Forecast ($000) – Not inflated

WC Code	WC Description	Current 2023/24	Yr. 1 2021/22	Yr. 2 2022/23	Yr. 3 2023/24	Total 2024-27	Total 2021-24
NA	Carparking maintenance	220	226	226	226	678	768

10 year forecasts are provided in the next table:

Table 7.75 Carparking 10 Year Maintenance Forecast ($000) – Not inflated

WC Code	24/25	25/26	26/27	27/28	28/29	29/30	30/31	31/32	32/33	33/34
NA	226	226	226	226	226	226	226	226	226	226

A summary short term renewals forecast is described in the following table:

Table 7.76 Carparking Short Term Renewal Forecast ($000) – Not inflated

WC Code	WC Description	Current 2023/24	Yr. 1 2024/25	Yr. 2 2025/26	Yr. 3 2026/27	Total 2024-27	Total 2021-24
	On Street Meter Replacement	0	0	20	0	20	800

10 year forecasts are provided in the next table, 2029/30 allows for the replacement of the new parking kiosk equipment:

Table 7.77 Carparking 10 Year Renewal Forecast ($000) – Not inflated

WC	24/25	25/26	26/27	27/28	28/29	29/30	30/31	31/32	32/33	33/34
	0	20	0	20	0	1000	20	0	60	1040

7.11.3 Car Parking Capital Development

The carparking strategy approach is as demand changes within the CBD and suburbs, Council may respond by purchasing land for off street parks or by deploying new equipment where political interest exists or a financial return can be made.

Existing sites currently owned are planned to be refurbished and chip sealed where in gravel, to provide a higher level of service.

Options considered for carparking include the level of service required and the surfacing needed.

Co-investment with suppliers could be considered where there is appropriate need and opportunity. Such options may include who runs the carpark through to who helps fund it.

Stirling Point Carpark is an ongoing issue for the community of Bluff. Tourist demand creating congestion, traffic and pedestrian safety need to be resolved. Council is proposing to invest in investigating potential solutions and putting an indication of funding that maybe required for future plans.

Table 7.77 Stirling Point Carpark 10 Year Development Forecast ($000) – Not inflated

WC	24/25	25/26	26/27	27/28	28/29	29/30	30/31	31/32	32/33	33/34
	$50	$20	$0	$0	$50	$0	$0	$0	$0	$0

Council LTP Workshops

Through the LTP workshopping process the Council advised that Stirling Point Options Investigation and Implication project be pushed outside of the 10-year LTP timeframe and to reassess the $20,000 in 2024/25, $50,000 in 2025/26 and $1m recommended in 2031/32 were removed from the programme.

7.12 OTHER ASSETS – UNSUBSIDISED

7.12.1 Other Assets Maintenance

Table 7.78 Other Assets Maintenance

Work Category	Key activity	Sub-activity	Comment
NA – Unsub	Other assets maintenance	Street furniture	Routine maintenance
		Litter bin emptying	

Council recently invested around $20M in Esk and Don and a need with a focus on high quality finishes a high level of operational response needed to respect this investment. Increased investment into the daily cleaning, rubbish collecting around seating, specialised poles, play elements, rain gardens etc. and it is important that response to any damage is done in a timely manner.

Suburban and areas outside of the heart of the CBD have street features and furniture are checked and cleaned as part of the routine regular maintenance activity. Specialised cleans are programmed to keep those areas tidy and acceptable to the area.

Rubbish bins are cleaned and emptied on a regular basis (three times per week) as part of the refuse contract.

CCTV operational cost will also be included.

7.12.2 Other Assets Renewals

Table 7.79 Other Assets Renewals

Work Category	Key activity	Sub-activity	Comment
NA – Unsub	Other assets renewals	Street furniture	Programmed work

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The options for renewal of other assets are an area where further improvement is required. Historically these types of assets have been funded from loan and no renewal plan has been considered for them. Many are associated with Inner City activities and have a reasonably short life span as they are renewed as development is undertaken. Future consideration of options should be made and funded.

Some elements may not be renewed in the future where the community interest has shifted.

Current budgets remain consistent with some changes through the new maintenance contract for street sweeping and footpath sweeping. These budgets are adjusted at the anticipated expiring of the current contract and it is expected a market price will be reflected.

Table 7.80 Other Assets Capital – Renewal Projects

Year	Proposed Projects	Costs
2023-	CCTV	$2,152,000
2024	69 Don Street – Demolish Building	$75,000
2025	City Centre Stage 2A	$9,365,000
2028	City Centre Stage 2B	$5,050,000
2035	Suburban Refresh – Bluff	$3,500,000
2037	Suburban Refresh – Windsor	$3,000,000

2039	Suburban Refresh – South City	$3,000,000

The calculated depreciation from street features is budgeted and where not fully utilised has been allocated to a net debt account for future activities.

Recommended Programme

Maintenance budgets have made allowance for updated technology and some improvements to the surfaces of off-street carparks. Options for maintenance expenditure have not been developed as the current investment is reactive and considered appropriate.

Table 7.81 Other Assets Short Term Maintenance Forecast ($000) – Not inflated

WC Code	WC Description	Current 2023/24	Yr. 1 2021/22	Yr. 2 2022/23	Yr. 3 2023/24	Total 2024-27	Total 2021-24
NA	Carparking maintenance		$1,380	$1,380	$1,380	$4,140	

10 year forecasts are provided in the next table:

Table 7.82 Other Assets 10 Year Maintenance Forecast ($000) – Not inflated

WC Code	24/25	25/26	26/27	27/28	28/29	29/30	30/31	31/32	32/33	33/34
NA	$1,380	$1,380	$1,380	$1,380	$1,380	$1,380	$1,380	$1,380	$1,380	$1,380

A summary short term renewals forecast is described in the following table:

Table 7.83 Other Assets Short Term Renewal Forecast ($000) – Not inflated

WC Code	WC Description	Current 2023/24	Yr. 1 2024/25	Yr. 2 2025/26	Yr. 3 2026/27	Total 2024-27	Total 2021-24
NA	On Street Meter Replacement	0	0	20	0	20	800

10 year forecasts are provided in the next table:

Table 7.84 Other Assets 10 Year Renewal Forecast ($000) – Not inflated

WC	24/25	25/26	26/27	27/28	28/29	29/30	30/31	31/32	32/33	33/34
NA	$6,775	$200	$200	$10,200	$200	$3,200	$200	$3,200	$200	$200

Council LTP Workshops

Through the LTP workshopping process the Council advised to defer the suburban refresh of Bluff, South City and Windsor areas by 7 years for affordability purposes.

7.12.2 Other Assets Capital Development

City Centre Renewal projects will highlight a significant number of new assets and many which can be removed. No new activities are proposed as part of these developments.

7.13 EMERGENCY WORKS AND MINOR EVENTS

Emergency Works involves the response to a defined, major, short-duration natural event (a qualifying event) that has reduced or will reduce customer levels of transport

service significantly below those that existed prior to the event and results in unforeseen, significant expenditure.

Minor Events involves the response to minor, short duration, natural events that reduce service levels on part of the transport network.

Table 7.85 Emergency Works and Minor Events

NZTA Work Category	Work activity	Description
140	Minor Events *Activities that would otherwise qualify as emergency works except that the total cost of the works is less than $100,000 per event*	Removal of rocks and slip material from roads and cycleways that have resulted from minor events
		Repairs to road and cycleway surfaces in response to minor events
		Reinstatement of network facilities damaged as a result of a minor event
141	Emergency Works *Any immediate response required for public safety or to provide vital access and reinstatement of customer levels of transport service*	Events of unusually large magnitude or severity for the particular area in which they occur (e.g. annual return period greater than one in 10 years)
		Events that originate from natural, short duration triggering events, including very high intensity rainfall, severe wind, severe drought or seismic events
		Events which have reduced or will reduce within a 12-month period, levels of transport service significantly below those that existed prior to the event
		Events that involve a total cost of $100,000 or more per event

Council has not historically encountered emergency works due to a natural event and accordingly has not budgeted or claimed under the Waka Kotahi work category.

7.14 RESILIENCE IMPROVEMENTS

This work category provides for non-routine work to protect roading assets from damage and to minimise the threat of road closure from natural phenomena. It involves capital works that typically reduce or mitigate natural hazard risks.

Table 7.81 Resilience Improvements

NZTA Work Category	Work Activity	Description
357	Resilience Improvements	New works to protect existing roads from sea or river damage
		New drainage for incipient slips or toe-weighting of unstable slopes
		Protection planting designed to arrest the slumping or displacement of a road platform
		Work to overcome changes in a river's course or bed level that threaten roads, bridges or other road-related structures, but which is not attributable to one climatic event

The Council currently has completed works on Stead Street but it was included the works under work category 341 LCLR.

One opportunity that may be considered in the future is the strengthening of a weight restricted bridge on the only state highway diversion route between Invercargill and Bluff – however, this has no priority either for ICC or Waka Kotahi at this time.

There are no areas at present where the risk of flooding of critical routes is considered of sufficient concern to warrant investment in improved drainage capacity.

There are two historic landfills within the Invercargill City Council district, Ocean Beach Alliance Landfill and New River Estuary Landfill. Ocean Beach Landfill, situated in unformed road, was created by Alliance is eroding, asbestos is being released to the coastal marine area. This issue has mixed property ownership with a stakeholder group working through the remedial action plan. Negotiations about funding responsibilities are currently being worked through. ICC owns 8.4%-26.5% (portion of land is Foreshore and determination on ownership is being questioned through LINZ) of the land which is actively eroding Cell D, and has 100% ownership of Cells A though C. Department of Conservation is leading the remediation project for Cell D. Cost for reinstatement of Cell D is $1,110,000. Council could be required to fund between $93,240 – 294,250. The stakeholder group are apply for funds from the Ministry for the Environment (MfE) through its non-contestable fund. Cells A-C funding requirements to remediate are:

Item	Cell A (75 m)			Cell B (75 m)			Cell C (100 m)		
	Short Term	Medium Term	Long Term	Short Term	Medium Term	Long Term	Short Term	Medium Term	Long Term
Design and Consenting									
Design and consenting[1]		$150,000	$150,000	$150,000		$150,000	$150,000		$150,000
Landfill removal									
Site establishment and contamination management[2]		$55,000	$55,000	$55,000		$55,000	$60,000		$60,000
Excavation, cartage, and disposal of contaminated material[3]		$230,000	$120,000	$230,000		$120,000	$305,000		$150,000
Backfill/prepare surface[4]		$15,000	$15,000	$15,000		$15,000	$20,000		$20,000
Decontamination and recycling facilities[5]		$30,000	$30,000	$30,000		$30,000	$30,000		$30,000
Validation and reporting[6]		$30,000	$30,000	$30,000		$30,000	$30,000		$30,000
Interim/Rock revetment construction									
Interim wall design and construction[7]		$450,000		$450,000			$680,000		
Revetment upgrade[8]			$450,000			$450,000			$680,000
Monitoring									
Monitoring and reporting[9]	$115,000								
Rock wall inspection[10]		$50,000	$50,000	$50,000	$50,000	$50,000	$50,000	$50,000	$50,000
Sub total (per epoch) ex contingency	$115,000	$1,010,000	$900,000	$1,010,000	$50,000	$900,000	$1,325,000	$50,000	$1,170,000
Contingency[11]	30%	35%	40%	30%	35%	40%	30%	35%	40%
Sub total (per epoch) inc contingency	$149,500	$1,363,500	$1,260,00	$1,313,00	$67,500	$1,260,000	$1,722,500	$67,500	$1,638,000
Sub total (all epochs) Inc contingency		**$2,773,000**			**$2,640,500**			**$3,428,000**	

Council will need to consider the risk and benefit of each option and how it would like to fund the work and who may contribute to the resolution, i.e. Alliance and MfE.

At the time of writing this plan, geotechnical investigation are starting on Awarua Bay Road, it has minor coastal erosion reported. Funding may be required in the future to realign the road, coastal protection or for a new road. This needs to be strategically planned for the land use in the area. These have not been forecast with Waka Kotahi to date and need included in the 2024-27 NLTF bid as it will be attended to under maintenance while the resolution is compiled and bid for in the next NLTF.

Table 7.82 Resilience Improvements Short Term Forecast ($000)

WC Code	WC Description	Current 2023/24	Yr. 1 2024/25	Yr. 2 2025/26	Yr. 3 2026/27	Total 2024-27	Total 2021-24
357	Resilience Improvements	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0

NA	Landfill Issues	$250	$3,185	$0	$0	$3,185	$

10 year forecasts are provided in the next table:

Table 7.83 Resilience Improvements 10 Year Forecast ($000)

WC	24/25	25/26	26/27	27/28	28/29	29/30	30/31	31/32	32/33	33/34
357	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
NA	$3,185	$0	$0	$0	$0	$0	$0	$0	$0	$1,498

7.15 LOW COST LOW RISK IMPROVEMENTS

This work category provides for the construction / implementation of low-cost / low-risk improvements to the transport system to a maximum total cost for approval per project of $2,000,000.

Table 7.84 Low Cost Low Risk Improvements

NZTA Work Category	Work activity	Description
341	Low Cost Low Risk Improvements	Capital works typically of a small scale targeted to a range of activity objectives – see detailed list below

Examples of qualifying activities include, but may not be limited to:

- small, isolated geometric road and intersection improvements
- traffic calming measures
- traffic management systems
- surface treatment (safety), including sealing for bridge approaches
- lighting improvements for safety
- installation of new traffic signs and markings, or upgrading these to the current standard
- provision of guard-railing
- sight benching to improve visibility
- walking facilities that comply
- cycling facilities that comply
- structures, culverts or stock access
- stock effluent facilities
- minor engineering works associated with community programmes
- behaviour change activities
- property and professional services costs associated with the improvement

Typically for ICC these projects are relatively low cost and do not require a full economic evaluation to justify. Historically these have been called minor works or minor improvements and have been targeted at safety improvements and more recently also at associated improvements.

Council has a deficiency database which identifies risks, with works prioritised targeting risk reduction and improving safety. This aligns with the Problem Statement identified earlier.

Most improvements are targeted at intersections and other high safety risk areas. The funding requested in this area have previously allowed for one intersection improvement annually, such as a small roundabout or a set of pedestrian signals and a number of low cost activities. Waka Kotahi have advised that a systems approach to a road corridor is has better strategic outcomefor the community. Our LCLR programme has developed with this in mind. Some of the budget area is also required where improvements in renewal projects need associated works. This can reduce the amount assigned to safety projects.

Assessment of Options

The options considered are as follows:

- *Low Budget (historical) - $700,000*
  This was historically based on 5% of the renewals budget and was the norm for many years by Waka Kotahi. On this basis ICC has programmed around $600,000 per year.

- *Mid-Range - $1,600,000*
  This budget range allows for several projects which could improve safety and/or accessibility, with more extensive range of smaller projects.

- *High Budget - $3,000,000 plus*
  The deficiency database indicative cost suggests numerous projects exist. These projects have been worked through and prioritised with Waka Kotahi – Road to Zero team to identify projects which will have the most significant outcome to reduce Invercargill's death and serious injury accidents. The programme was produced with consideration to the Council desire to put invest its local share towards making a step change impact and funding safety within our community and the roading network.

Recommended Programme

The recommended programme is the high-budget option of around $3 million^{+} per annum for 6 years, this address the backlog of safety needs and address Invercargill's safety problems, then revert to a mid-range budget $2M to year 10, and $1.6M thereafter. As shown in the evidence base, the City is amongst the worst in New Zealand in terms of deaths and serious injuries especially at intersections and for vulnerable road users.

A list of candidate projects is provided in the Low Cost Low Risk Bid 2024-27 (Appendix 7). The following are the sub-activity areas proposed:

Table 7.85 Low Cost Low Risk Improvements Programme

Sub-activity	Yrs 1-3	Yrs 4-10	Yrs 11-30
	$000	**$000**	**$000**
Active Transport Projects (Walking and Cycling)	$450.0	$2,150.0	$3,600.0
Corridor / Intersection Improvements	$6,315.0	$12,405.0	$24,685.0
Speed Management (incl. LATM)	$1,100.0	$3,500.0	$0.0
Inner City Safety Improvements	$880.0	$0.0	$0.0
Minor project Deficiencies	$450.0	$1,050.0	$3,000.0
Otatara School	$1,000.0	$850.0	$850.0
TOTAL	**$10,195.0**	**$18,955.0**	**$32,135.0**

Table 7.86 Low Cost Low Risk Short Term Forecast ($000) – Not inflated

WC Code	WC Description	Current 2023/24	Yr. 1 2021/22	Yr. 2 2022/23	Yr. 3 2023/24	Total 2024-27	Total 2021-24
341	Low Cost Low Risk Improvements	$2,440	$3,200.0	$4,640.0	$2,355.0	$10,195.0	$6,620.0

10 year forecasts are provided in the next table:

Table 7.87 Low Cost Low Risk 10 Year Forecast ($000) – Not inflated

WC	24/25	25/26	26/27	27/28	28/29	29/30	30/31	31/32	32/33	33/34
341	$3,200	$4,640	$2,355	$3,015	$3,015	$3,015	$2,525	$2,525	$2,525	$2,525

Low Cost Low Risk Summary and Programme Needs

A summary of the activity and its programme needs and recommendations is provided following the next section, in combination with the Road Safety programme.

7.16 PROMOTION OF ROAD SAFETY AND DEMAND MANAGEMENT ACTIVITIES

Community programmes are activities taking place at the local level to promote the safe and sustainable use of the land transport system. This section is aligned with the Waka Kotahi vision Zero mission statement.

Table 7.88 Community Education Programmes

NZTA Work Category	Key activity	Description
432	Safety promotion, education and advertising	Road safety coordination committee meetings
		Road safety coordinator
		Community programmes targeted to school safety education
		Development / updating of Road Safety Action Plan
		Focus on programmes that reduce serious injuries and deaths associated with alcohol, safety with age; use of restraints in vehicles; and appropriate speeds
421	Travel demand management	Travel behaviour change activities, promotion and information, parking management

In more detail, road safety related activities may include:

- Workshops, seminars or displays to raise awareness of national, regional and local land transport safety issues
- Safety education in schools, driver education and information, walking and cycling safety
- Advertising (e.g. billboards, radio, television, digital, print and other media)
- Delivery of education, advertising, awareness raising or public information initiatives that reinforce or complement related activities across the NLTP (e.g. integrated packages of activities)
- Provision of integrated advice, information and support to community groups
- Preparation and implementation of travel plans and neighbourhood accessibility plans that address identified safety risks and may be supported by infrastructure improvements
- Driver licensing courses where subsets of the community have not moved through the graduated licence system and require support to do so

In more detail, Travel demand related activities may include:

- Parking management
- Travel behaviour change activities, including the preparation of travel plans and neighbourhood accessibility plans, and associated education and promotion initiatives where these are targeted towards efficient and effective use of the land transport system

- Promotion and information activities (network user information) which maximise the efficiency of the road network, for example congestion relief, travel planning or mode shift promotion

Outcomes that these programmes can generate include:

- Encourage community participation in land transport decision-making
- Assist communities to identify their land transport issues and develop their own informed decisions
- Increase the community's capacity to address local transport issues
- Develop and motivate local partnerships
- Develop and motivate stakeholder partnerships (road safety coordination committee)
- Integrate activities at the local level
- Generate insight on local transport issues and new ideas that can be further developed for wider application
- Engagement of road safety coordinator to focus on the outputs and outcomes of this work category

There are currently no initiatives planned in WC421, but the need for a travel demand management programme is to be investigated through the Integrated Transport Strategy and added to the Improvement Plan.

The Council has a collaborative road safety programme in place with Southland and Gore District Councils, and a list of specific actions to address a range of factors is provided in Appendix 11. These include speed, younger drivers, older drivers, high risk drivers, motorcyclists, alcohol and drugs, use of restraints, cycling and walking, etc.

Assessment of Options

An assessment of alternative investment levels has not been carried out. While the proposed annual expenditure has increased by $200,000 over the current budget, road safety is an area where Invercargill has a significant problem. It is necessary to address this problem using a "whole of systems" approach, targeting not only engineering interventions but also education and enforcement in an effort to change road user behaviours and reduce crash rates.

The programme activities in this area will target the identified crash factors and road safety problems, be developed in consultation with the Council's road safety partners, and delivery coordinated with the efforts and programmes of partner agencies.

Note below is Road Safe Southland in the combined line and ICC in the 432 line.

Recommended Programme

Table 7.89 Recommended Community Education Programme Short Term Forecast ($000) – Not inflated

WC Code	WC Description	Current 2023/24	Yr. 1 2021/22	Yr. 2 2022/23	Yr. 3 2023/24	Total 2024-27	Total 2021-24
Combined	Community Education – Road Safety Promotions	$593.6	$570.0	$570.0	$570.0	$1,710.0	$1,577.0
432	Community Education – Road Safety Promotions	x	$345	$345	$345	x	$1,035

10 year forecasts are provided in the next table:

Table 7.90 Recommended Community Education Programme 10 Year Forecast ($000) – Not inflated

WC	24/25	25/26	26/27	27/28	28/29	29/30	30/31	31/32	32/33	33/34
432	$345	$345	$345	$345	$345	$345	$345	$345	$345	$345

Road Safety Promotion and Education Summary and Programme Needs

A summary of road safety programme needs and recommendations is provided below, in combination with the Low Cost Low Risk programme.

Low Cost Low Risk Projects / Road Safety – Activity Management Plan

Background - W/C 341 (LCLR) and 432 (Road Safety Promotion)

Prepared By: Lesley McCoy | Approved By: Doug Rodgers | Date: 10/23 | Revision 5

82. Project Delivery

This work category provides for the construction/implementation of low cost, low risk improvements to the transport system to a maximum total cost for approval per project of $2,000,000. Examples of qualifying activities include:

- small, isolated geometric road and intersection improvements
- traffic calming measures
- local area traffic management systems
- lighting improvements for safety
- installation of new traffic signs and markings (including rumble strips), or upgrading these to the current standard
- walking and cycling facilities
- minor engineering works associated with community programmes, such as raised platforms at roundabouts, traffic signals and other pedestrian facilities

As the Road Controlling Authority, ICC is also responsible for the delivery of Road Safety Promotion within Invercargill City.

83. Current Profile – Low Cost Low Risk Roading Improvements

The Low Cost, Low Risk funding category (formerly Minor Improvements) has been used by Council to facilitate implementation of physical work projects that have been identified as addressing predominantly safety related concerns on the transportation network.

Projects are prioritised based on expected results alignment, cost-benefit appraisal ratings and alignment with Councils transport strategies. This process has ensured that maximum value for money benefits are realised for the investment.

Council have historically spent approximately $1.5M per annum on minor improvement projects with the consequence that a number of key projects have been completed providing positive benefits to our customers and contributing to improved safety statistic for Invercargill.

Much work is still required to be undertaken to address issues highlighted in the Strategic Case and ensure the continued social and economic well-being of residents, visitors and businesses.

It is apparent from the statistic that Invercargill is overrepresented in a number of safety statistics when compared against other local authorities. Analysis of crash rates at intersections and targeted improvements at these locations are areas that Council can develop further when compiling future safety improvement programmes.

84. Comparison with Peers

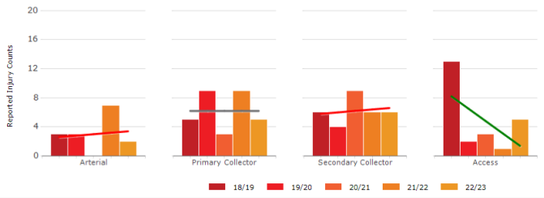
The Communities at Risk Register has been developed by the Transport Agency to identify communities of road users that are over-represented in terms of road safety risk. The register highlights personal risk to road users by ranking communities by local authority area based on the Safer Journeys areas of concern. This extract from the 2022 Communities at Risk Register for our Peer Group and the previous six year trend for Invercargill (Auckland Transport is excluded as it is broken into four distinct areas in the risk register). A ranking of 1 is the worst nationally and indicates very high risk.

2022 Community at Risk Register	ICC	CCC	KCDC	Napier	Nelson	PNCC	PCC	UHCC
All deaths and serious casualties	21	62	59	44	42	19	64	56
Young drivers (aged 16-24yrs)	18	56	38	47	43	37	59	57
Alcohol and/or drugs	29	47	59	39	42	24	49	66
Speed (too fast for the conditions)	26	59	64	34	28	18	56	46
Urban intersections	12	34	48	27	41	25	60	47
Rural intersections	14	52	44	43	19	2	57	18
All intersections	1	11	49	8	16	3	59	30
Rural road loss of control and/or head-on	23	63	62	58	44	46	67	57
Motorcyclist involved	47	49	45	40	27	25	39	28
Cyclist involved	5	24	26	1	45	19	52	51
Pedestrian involved	27	39	62	14	43	28	63	65
Driver Distraction	11	40	58	42	4	18	28	71
Fatigue	51	63	64	46	58	53	47	68
Older road users (>75years)	4	34	27	19	5	61	53	10
Restraints (seatbelt not worn)	50	63	66	46	69	37	61	55

	2017	2018	2019	2020	2021	2022
All deaths and serious casualties	47	31	28	29	29	21
Young drivers (aged 16-24yrs)	26	21	8	13	13	18
Alcohol and/or drugs	49	36	37	33	22	29
Speed (too fast for the conditions)	60	60	44	41	44	26
Urban intersections	15	11	7	8	9	12
Rural intersections	3	4	3	6	5	14
All intersections	3	2	1	1	1	1
Rural road loss of control and/or head-on	61	60	56	48	49	23
Motorcyclist involved	54	36	48	34	31	47
Cyclist involved	1	7	7	10	2	5
Pedestrian involved	1	7	9	14	33	27
Driver Distraction	58	8	19	16	16	11
Fatigue	56	60	40	40	42	51
Older road users (>75years)	14	8	15	9	5	4
Restraints (seatbelt not worn)	42	43	38	39	45	50

85. Invercargill Accident Trends

The five year trend for fatalities and serious injuries is trending down for the access roads but showing increases for the other road classifications. Low Volume is not included below due to a low number of accidents. In terms of Vision Zero there needs to be further work to identify projects and to prioritise these works.



Prioritisation: Develop a methodology to assist with prioritisation of accidents on the network according to ONRC classification

86. Top Priorities

- **Intersections**: As can be seen the highest priority area is at intersections. The disappointing aspect about the safety record is that there has been very little community concern or recognition that improvements are needed and the performance is unacceptable. The more difficult aspect is that the safety incidents are not occurring at a location but are more system wide and need behavioural inputs from the community to make improvements.

Strategy: Develop a strategy for road risk management including speed management through localised traffic design

Speed: Implement network management to reduce operating speed and risk areas

- **Vulnerable Road Users** (Pedestrians and Cyclists): Unforgiving infrastructure and poor road user behaviour is resulting in significantly higher than average rates of harm to people on bikes. Increased use of the road corridor by all modes and the lack of dedicated space for cyclists, means there is ongoing conflict between vulnerable road users and vehicles, which have greater speed and mass. The increasing use of eBikes also will create problems where increased speed will leave less room for error.

Strategy: Develop and implement a Safety Strategy where community behavioural change occurs which leads to safer outcomes for vulnerable road users.

87. Waka Kotahi Programme

This programme has been developed to align to the Roading Activity Plan which through the ILM and problem statement development identified safety as a significant and high priority. The Community at Risk Register has assisted the focus on the areas where LCLR works should be undertaken and this programme has aligned with these areas being intersections and vulnerable users.

The cost benefit of these works will be a good fit and deliver benefits as the intersections and works identified have known crash and operational issues which the works plan to mitigate and resolve.

The works proposed in this programme are all relatively low cost solutions.

One of the major works completed is the Invercargill to Bluff Cycle path (as part of the Lumsden to Bluff Heartland Ride and the Te Araroa Trail). This has a strong fit with the GPS. The project is the completion of the trail from existing projects and is typically along SH1 to Bluff within the road corridor and taken the cyclist and pedestrian off the carriageway.

The local road improvement programme has been developed with the Waka Kotahi – Road to Zero team. It focuses on treating road corridors rather the solo intersection which means that more intersections qualify for LCLR funding, this will be an excellent community outcome.

88. Project Prioritisation

Council recognises that there are often a range of factors that contribute to serious crashes, including road design and condition. To reduce the number of serious crashes, Council prefers to take a co-ordinated, inter-agency approach to provide a safe road system targeting safer speeds, safe road use, safe vehicles and roadsides. To address this issue Council will:

- Prioritise treatments to evidence-based high risk areas, especially intersections
- Continue to work with road partners and develop road safety promotions targeting key risk areas
- Create a more forgiving road system, by developing a safe system approach
- Utilise the deficiency database to manage potential projects
- Evaluate safety improvements on unsealed roads such as traction seals or dust suppression for safety

89. Forward Programme

The recommended development programme for this budget is the High-Range option of $3M +. This option supports further investment from previous years but is strongly aligned to the needs of safety improvements identified in the problem statement. Whilst this level is an increase it suggests that at this rate, the potential to reduce the current deficiencies would take in excess of 6 years without any new items added.

Road Safety Promotion is a shared activity between Invercargill City, Southland District and Gore District but each other's bids are individual the programme and the funding are contingent on all being successfully funded as a package.

W/C	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030-2034	2034-38	2038-2042	2042-2046	2046-2050
341 $(k)	$3,200	$4,640	$2,355	$3,015	$3,015	$3,015	$10,100	$7,450	$6,400	$6,400	$6,400
432 $(k)	$345	$345	$345	$345	$345	$345	$1,380	$1,380	$1,380	$1,380	$1,380

7.17 INVESTMENT MANAGEMENT WORK CATEGORIES

7.17.1 Asset Management Planning

Table 7.91 Asset Management Planning

NZTA Work Category	Key Activity	Description
003	Asset Management Planning	Provides for the preparation and improvement of: • transport network activity management plans (AMP) • regional public transport plans (RPTP) • road safety action plans (RSAP) • procurement strategies

In more detail the activities may include:

- Development of national and regional speed management plans (from 2024)
- Development of a Road Safety Action Plan for the district (including Waka Kotahi; NZ Police; ACC) for Invercargill with a focus on factors such as alcohol, safety with age, restraints and speed
- As part of the improvement of plans:
  - community consultation related to the improvement of AMPs, RPTPs and speed management plans
  - associated demand forecasting and demand management planning
  - development of levels of service targets and implementation plans
  - asset performance and service gap analysis
  - optimisation process development, including development of network operating plans
  - financial forecasts
  - development and improvement of asset deterioration models

Recommended Programme

No alternative options have been considered at this time. The recommended programme is small in comparison to others, but is important to effective planning for the network. It allows for the 3-yearly cycle of planning, with more emphasis in the years preceding development of Long Term Plans and submission of the Programme Business Case to NZTA. It has not been appropriately funded in earlier years.

Table 7.92 Activity Management Planning Short Term Forecast ($000) – Not inflated

WC Code	WC Description	Current 2023/24	Yr. 1 2024/25	Yr. 2 2025/26	Yr. 3 2026/27	Total 2021-24	Total 2024-27
003	AM Planning	$122.5	$210.0	$85.0	$15.0	$122.5	$310.0

Table 7.93 Activity Management Planning 10 Year Forecast ($000) – Not inflated

WC Code	24/25	25/26	26/27	27/28	28/29	29/30	30/31	31/32	32/33	33/34
003	$210	$85	$15	$30	$85	$65	$30	$85	$65	$30

7.17.2 Programme Business Case Development

Table 7.94 Programme Business Case Development

NZTA Work Category	Key activity	Description
004	PBC Development	Provides for the preparation of programme business cases under Waka Kotahi Business Case Approach, including supporting evidence collection and model application.

In more detail the activities may include:

- Collecting evidence to inform specific components of the programme business case
- Applying modelling, e.g. through the use of a transport model or network operating plan, to test assumptions within the business case, or to forecast demand
- Developing a regional, inter-regional or sub-regional programme business case

Recommended Programme

No alternative options have been considered at this time. The recommended programme is small in comparison to others, but is also important in securing appropriate levels of funding to support the effective management of the network.

No funding request has been made.

Table 7.95 Activity Management Planning Short Term Forecast ($000)

WC Code	WC Description	Current 2023/24	Yr. 1 2024/25	Yr. 2 2025/26	Yr. 3 2026/27	Total 2018-21	Total 2024-27
004	PBC Development						

Table 7.96 Activity Management Planning 10 Year Forecast ($000)

WC Code	24/25	25/26	26/27	27/28	28/29	29/30	30/31	31/32	32/33	33/34
004										

7.18 NETWORK AND ASSET MANAGEMENT

This work category provides for the general management and control of the road network and management of road assets.

Waka Kotahi funding assistance for qualifying activities includes the following:

Table 7.97 Network and Asset Management

NZTA Work Category	Key activity	Description
151	Network and asset management	Management of the road network
		Implementation and operation of RAMM
		Roughness and condition rating surveys
		Traffic counts
		Bridge inspections and investigations (including postings)
		Road network inspections and field validations
		Road legalisation

		Professional services

In more detail the activities may include:

- Management of the road network
- Promotion and information activities that maximise the efficiency of the road network in support of the asset management plan
- Implementation and operation of road asset management systems
- Regular, routine updates to the asset management plan
- Roughness and condition rating surveys
- Traffic count surveys, including pedestrian and cycle counts
- Road network inspections and field validation of proposed programmes
- Routine refreshing of the asset deterioration model
- Maintenance and routine updating of transport models
- Legalisation of existing road reserves as specified below
- Special road maintenance, renewal or improvement related studies that do not fit the transport planning work categories' description, e.g. KiwiRap studies
- Professional services for road maintenance activity classes other than for operational traffic management and emergency works

Recommended Programme

Council's Infrastructure Department has been restructured. The restructure is such that Council has no internal Engineering Services Group for the Roading Asset or Transport Activity, this means that the professional service are now required to be procured. Increase in budgets below reflect the ongoing requirement to deliver network and asset management.

Being core activity, no alternative options have been considered. The recommended programme is significantly increased from the previous approved 3-year period.

Table 7.98 Network and Asset Management Short Term Forecast ($000) – Not inflated

WC Code	WC Description	Current 2023/24	Yr. 1 2024/25	Yr. 2 2025/26	Yr. 3 2026/27	Total 2024-27	Total 2021-24
151	Network and Asset Management	$915	$1,415	$1,315	$1,315	$4045	$2,913

Table 7.99 Network and Asset Management 10 Year Forecast ($000) – Not inflated

WC Code	24/25	25/26	26/27	27/28	28/29	29/30	30/31	31/32	32/33	33/34
151	$1,415	$1,315	$1,315	$1,315	$1,290	$1,240	$1,215	$1,215	$1,215	$1,215

Business Case W/C 151 (Network & Asset Mgmt) and 003 (Activity Mgmt)

Prepared By: Lesley McCoy	Approved By: Doug Rodgers	Date: 10/23	Revision 6

90. Activity Management

The previous delivery resource for the activity is from the Council Asset Team and the internal Engineering Services Group Business Unit. The current delivery is from the Strategic Asset Management Team, Operations Team and external Professional Services – Contract 1115 – Professional Core Services (WSP) and Contract 1234 – Resurfacing Professional Services.

The Strategic Assets Team (SAP) incorporates roles for Programming activities (both Waka Kotahi and ICC), budgets supervision, Waka Kotahi Procurement and Procedural processes, Programme and Performance Monitoring, RAMM Data management (including coordinating RAMM condition projects as JunoViewer , SCRIM, HSD, specialist bridge inspection etc), Traffic Counting coordination and validation, FWP preparation, Asset Management, Bylaws, Corridor management (TMC), Overweight Permit Management, Cycling, advice for Planning, Resource and Sub-divisional activity, Council reporting and Waka Kotahi Liaison. Coordination of the capital programme.

Network and Safety Management (part of SAP) team are responsible for carparking (asset provision) together with passenger transport and total mobility. Corridor Management (including Traffic Management reviews and approvals) and public liaison is also undertaken together with the daily interactions with customers. This also includes operational responsibility for the Utilities Act. Council also has a shared service with Southland and Gore District Councils to deliver the road safety promotion activity through Road Safety Southland. This is currently managed via Southland District Council.

The Council's in-house Operational team, provides engineering advice for maintenance contracts as the role of the Contract Manager and Contract Engineer and Engineers Rep, direct liaison with the contractor in the delivery of Contracts. They coordinate operational and maintenance works and programmes reporting to the Asset Team for approvals.

The external Professional Services Contractors undertakes the investigation, design and documentation of renewal projects and coordinates the procurement and delivery of these contracts they also undertake bridge inspections, design, and safety projects. Delivery of capital programmes.

91. Historic Expenditure

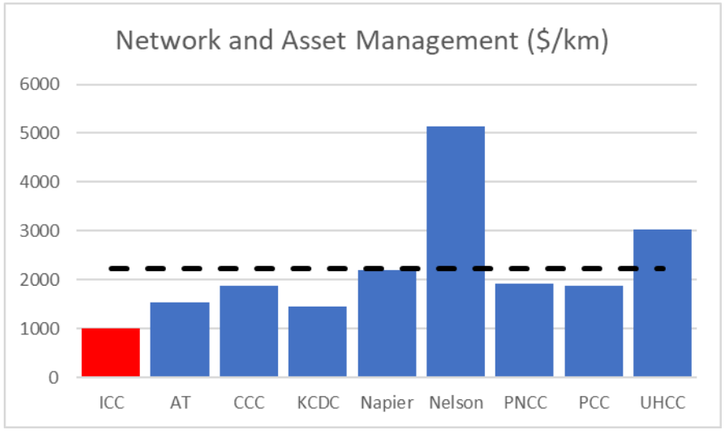
This work category provides for the general management and control of the road network and management of the road assets.

Year	**W/C 151** $(k)	**W/C 003** $(k)
2021/22	$986	$-
2022/23	$1,011	$-
2023/24	$915	$-

92. Comparison with Peers

Professional Services are responsible for all the activities on the network so one measure is the overall network cost.

Cost per km is previously less than all of our peers when compared on a per kilometre basis. Nelson City is a significant outlier.



Further investigation of all the activities that are conducted under other work categories than W/C 151 Network and Asset Management will probably identify expenditure which can be claimed in the correct category. Examples of qualifying activities include, but may not be limited to:

- Management of the road network
- Promotion and information activities which maximise the efficiency of the road network in support of the activity management plan.
- Implementation and operation of road asset management systems
- Roughness and condition rating surveys
- Traffic count surveys, including pedestrian and cycle counts
- Road network inspections and field validation of proposed programmes

Cost Management: Ensure time and cost management is aligned with correct cost centres.

93. Management Process

The key elements needed to support good asset and network management practices include the necessary processes, analysis and evaluation techniques needed for life cycle asset management which are aligned with the REG Group five Pillars of Success:

- **Systems**
- **Data**
- **Communication**
- **Approval Process**
- **Service Delivery**

94. Managing Delivery

RAMM – The RAMM system is the core database system used in the management of the roading and transport assets at the Council. RAMM is used nationally to manage state highway and local authority roading networks, thus allowing direct benchmarking of road condition and performance. The use of RAMM or an equivalent asset management system is a prerequisite of the New Zealand Transport Agency for obtaining Government funding for roading work.

Pavement Deterioration Model (JunoViewer) – is a pavement modelling system used to predict pavement deterioration and thus develop forward expenditure profiles for various user-defined scenarios. JunoViewer has been utilised for the AMP.

Procurement – The Council has an Waka Kotahi endorsed Procurement Strategy for roading works to ensure that procurement planning reflects the Invercargill City Council's corporate aims and priorities and is consistent with Council strategies and policies and Waka Kotahi NZTA funding and procurement rules.

Shared Services: Consider shared services with neighboring authorities, including but not only professional services.

95. Purpose

The roading network needs to provide a safe environment for travel for pedestrians, cyclists and motorists. Invercargill City needs to support the economy so that it can grow and that trucks and freight can travel with reliability. The roading network also needs to be sustainable and resilient to natural hazards and climatic changes.

The principle objectives of the Roading Activity are to:

- Provide a safe road environment
- Provide an efficient, effective, reliable and resilient integrated road network
- Deliver services that are value for money
- Manage assets prudently for current and future generations
- Provide access for the pedestrians and cyclists (vulnerable users) in the community

96. Forward Programme

The removal of Council internal Engineering Services Group for Roading and Transport requires an increase in funding to the 151 work category. The Activity Management category has not been bid for or claimed in the past. As Council has extra regional planning requirements through Passenger Transport to the RLTP, and the wellbeing of staff in the provision of Strategic Asset Management Council is seeking to have external assistance funding allocated to enable good strategic capability.

W/C	**2021/22**	**2022/23**	**2023/24**	**2024/25**	**2025/26**	**2026/27**	**2027/30**	**2031/35**	**2036/40**	**2041/45**	**2046/50**
151 $(k)	$1,415	$1,315	$1,315	$1,315	$1,290	$1,240	$4,935	$4,885	$4,960	$4,935	$4,885
003 $(k)	$210	$85	$15	$30	$85	$65	$210	$265	$245	$210	$265

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7.19 RECOMMENDED PROGRAMME

7.19.1 Evaluation of Options / Alternative Programmes

This evaluation, although basic in nature, highlights the option for improvement in the future to ensure that the right options are considered against the strategy for each area.

Note that in all programmes a base inflation assumption of 2.9 and 2.2% pa has been applied. The figures shown are those which are requested from Waka Kotahi and may have some misalignment to ICC budgets based on inflation impacts and what the final Waka Kotahi allocations are.

7.19.2 Recommended Investment Management and Operation / Maintenance Programmes

Included in Section 8.2 is a full table which outlines the proposed funding request aligned with the Waka KOtahi work categories and below are the operations and maintenance programmes.

An overall summary of the Waka Kotahi work categories is presented below.

Table 7.100 NZTA Work Categories - Not inflated (TBC with final bid)

Work Programme	Cat	Project Description	2024/25	2025/26	2026/27	Total 2024/27
Investment Management	3	Activity Management Planning	$ 210,000	$ 85,000	$ 15,000	$ 310,000
Investment Management	4	Programme Business Case Development	-	-	-	-
		Subtotal Investement Management	**$ 210,000**	**$ 85,000**	**$ 15,000**	**$ 310,000**
Work Programme	**Cat**	**Project Description**	**2024/25**	**2025/26**	**2026/27**	**Total 2024/27**
Maintenance and Operations	111	Sealed pavement maintenance	$ 2,300,000	$ 2,300,000	$ 2,300,000	$ 6,900,000
Maintenance and Operations	112	Unsealed pavement maintenance	$ 275,000	$ 275,000	$ 275,000	$ 825,000
Maintenance and Operations	113	Routine drainage maintenance	$ 420,000	$ 420,000	$ 420,000	$ 1,260,000
Maintenance and Operations	114	Structures maintenance	$ 150,000	$ 175,000	$ 175,000	$ 500,000
Maintenance and Operations	121	Environmental maintenance	$ 490,000	$ 490,000	$ 490,000	$ 1,470,000
Maintenance and Operations	122	Traffic services maintenance	$ 815,000	$ 815,000	$ 815,000	$ 2,445,000
Maintenance and Operations	123	Operational traffic management	$ 125,000	$ 133,000	$ 135,000	$ 393,000
Maintenance and Operations	124	Cycle path maintenance	$ 285,000	$ 285,000	$ 285,000	$ 855,000
Maintenance and Operations	125	Footpath maintenance	$ 345,000	$ 345,000	$ 345,000	$ 1,035,000
Maintenance and Operations	131	Level crossing warning devices	$ 30,000	$ 30,000	$ 75,000	$ 135,000
Maintenance and Operations	151	Network and asset management	$ 1,415,000	$ 1,315,000	$ 1,315,000	$ 4,045,000
		Subtotal Maintenance and Operations	**$ 6,650,000**	**$ 6,583,000**	**$ 6,630,000**	**$ 19,863,000**

7.7.3 Recommended Renewal Programmes

Included in Section 8.2 is a full table which outlines the proposed funding request aligned with the Waka Kotahi work categories and below are the renewal programmes.

An overall summary of the Waka Kotahi work categories is presented below.

Table 7.101 Recommended Renewal Programmes (TBC with final Bid)

Work Programme	Cat	Project Description	2024/25	2025/26	2026/27	Total 2024/27
Renewals	211	Unsealed road metalling	$ 360,000	$ 360,000	$ 360,000	$ 1,080,000
Renewals	212	Sealed road resurfacing	$ 6,100,000	$ 5,600,000	$ 7,200,000	$ 18,900,000
Renewals	213	Drainage renewals	$ 1,120,000	$ 1,120,000	$ 1,120,000	$ 3,360,000
Renewals	214	Sealed road pavement rehabilitation	$ 1,300,000	$ -	$ 3,500,000	$ 4,800,000
Renewals	215	Structures component replacements	$ 1,570,000	$ 570,000	$ 70,000	$ 2,210,000
Renewals	222	Traffic services renewals	$ 875,000	$ 570,000	$ 670,000	$ 2,115,000
Renewals	224	Cycleway renewals	$ -	$ -	$ -	$ -
Renewals	225	Footpath Renewals	$ 2,728,000	$ 2,100,000	$ 2,100,000	$ 6,928,000
		Subtotal Renewals	**$ 14,053,000**	**$ 10,320,000**	**$ 15,020,000**	**$ 39,393,000**

7.7.4 Recommended Capital Development and Community Education Programmes

An overall summary of the Waka Kotahi work categories is presented below.

Table 7.102 Recommended Capital Development and Community Education Programmes (TBC with final Bid)

Work Programme	Cat	Project Description	2024/25	2025/26	2026/27	Total 2024/27
Road Improvements	321	New Traffic Management Facilities	$ -	$ -	$ -	$ -
Road Improvements	322	Replacement of Bridges and Structures	$ -	$ -	$ -	$ -
Road Improvements	323	New Roads	$ -	$ -	$ -	$ -
Road Improvements	324	Road Improvements	$ -	$ -	$ -	$ -
Road Improvements	325	Seal Extensions	$ -	$ -	$ -	$ -
Road Improvements	332	Property Purchase	$ -	$ -	$ -	$ -
Road Improvements	333	Advanced Propoerty Purchase	$ -	$ -	$ -	$ -
Road Improvements	341	Low Cost Low Risk	$ 3,444,000	$ 3,484,000	$ 3,444,000	$ 10,372,000
Road Improvements	357	Resilence Improvements	$ -	$ -	$ -	$ -
		Subtotal Road Improvements	**$ 3,444,000**	**$ 3,484,000**	**$ 3,444,000**	**$ 10,372,000**
Work Programme	**Cat**	**Project Description**	**2024/25**	**2025/26**	**2026/27**	**Total 2024/27**
Road Safety Promotion and Demand Management	432	Safety, promotion, education and advertising	$ 385,000	$ 385,000	$ 385,000	$ 1,155,000
	421	Travel Demand Management	$ -	$ -	$ -	$ -
		Subtotal RSP and Demand Management	**$ 385,000**	**$ 385,000**	**$ 385,000**	**$ 1,155,000**
Work Programme	**Cat**	**Project Description**	**2024/25**	**2025/26**	**2026/27**	**Total 2024/27**
Walking and Cycling Improvements	451	Walking Facilities	$ -	$ -	$ -	$ -
	452	Cycling Facilities	$ -	$ -	$ -	$ -
		Subtotal Walking and Cycling Improvements	**$ -**	**$ -**	**$ -**	**$ -**

7.20 HOW THE ACTIVITY WILL BE RESOURCED

7.20.1 Internal Resourcing

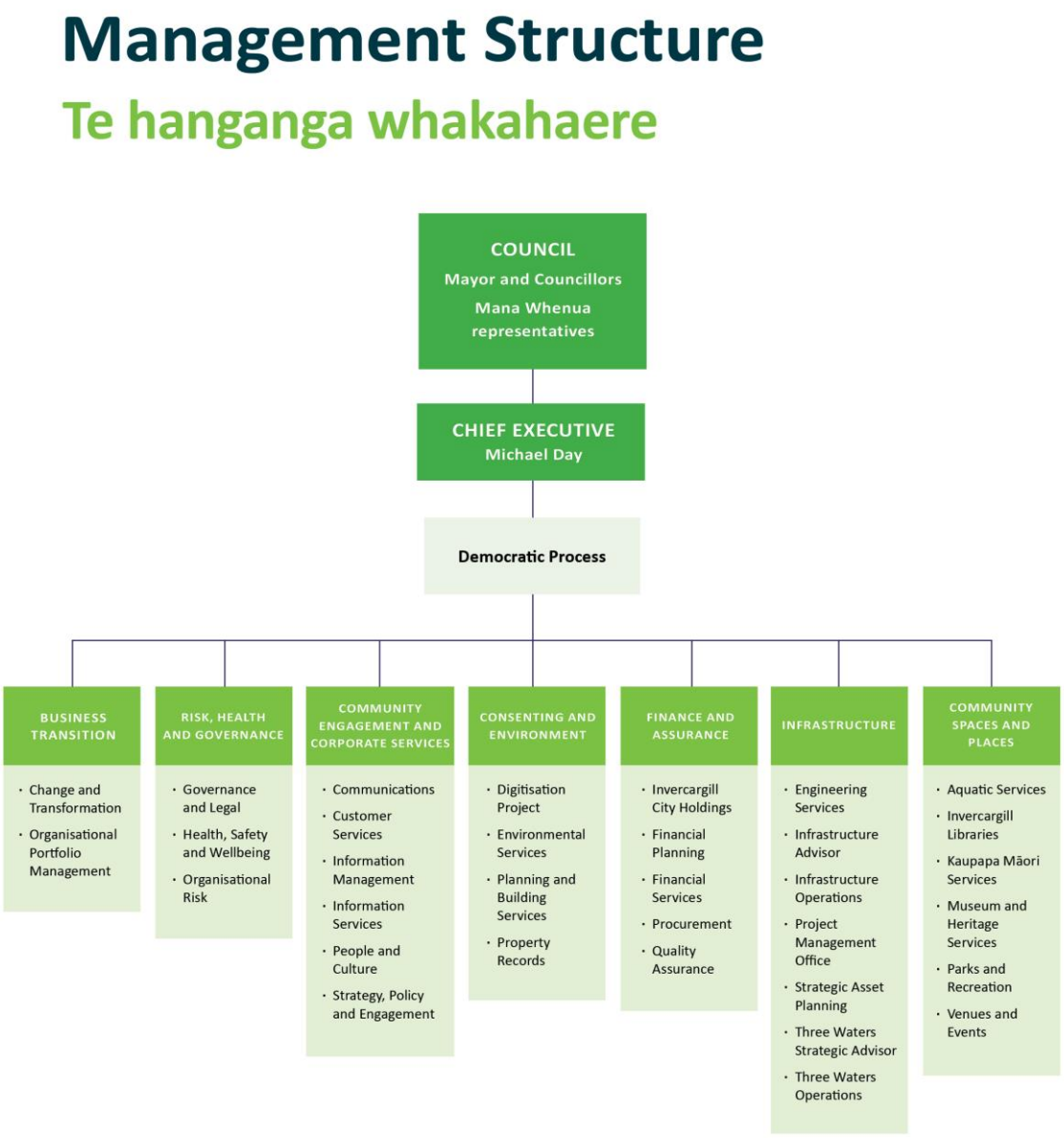
The current delivery resource for the activity is from the Council Strategic Asset Planning Team (incl. Network and Safety Management) and Operational Delivery Team.

The Strategic Assets Team (SAP) incorporates roles for Programming activities (both Waka Kotahi and ICC), budgets supervision, Waka Kotahi Procurement and Procedural processes, Programme and Performance Monitoring, RAMM Data management (including coordinating RAMM condition projects as JunoViewer , SCRIM, HSD, specialist bridge inspection etc), Traffic Counting coordination and validation, FWP preparation, Asset Management, Bylaws, Corridor management (TMC), Overweight Permit Management, Cycling, advice for Planning, Resource and Sub-divisional activity, Council reporting and Waka Kotahi Liaison. Coordination of the capital programme.

Network and Safety Management (part of SAP) team are responsible for carparking (asset provision) together with passenger transport and total mobility. Corridor Management (including Traffic Management reviews and approvals) and public liaison is also undertaken together with the daily interactions with customers. This also includes operational responsibility for the Utilities Act. Council also has a shared service with Southland and Gore District Councils to deliver the road safety promotion activity through Road Safety Southland. This is currently managed via Southland District Council.

The Council's in-house Operational team, provides engineering advice for maintenance contracts as the role of the Contract Manager and Contract Engineer and Engineers Rep, direct liaison with the contractor in the delivery of Contracts. They coordinate operational and maintenance works and programmes reporting to the Asset Team for approvals.

The external Professional Services Contractors undertakes the investigation, design and documentation of renewal projects and coordinates the procurement and delivery of these contracts they also undertake bridge inspections, design, and safety projects.



7.20.2 Procurement Strategy

Council has a Procurement Strategy which is used for any non-subsidised expenditure. Council Also have a Waka Kotahi endorsed Transport Procurement Policy.

Council procures its physical works contracts via the open tender market.

The maintenance contracts are:

- Road Corridor Maintenance (which includes all sealed and unsealed pavements, pavement, signs, kerb and channel, drainage, road marking, footpaths, bus shelters and carparks, streetlight maintenance etc.)
- Traffic Signals Maintenance

Renewals contracts are typically offered on an annual basis for:

- Resurfacing – Chipsealing and Asphaltic Concrete
- Individual or group Rehabilitation Projects
- Low Cost Low Risk Projects (or via the maintenance contract)
- Specific Street lighting or Traffic Signal Projects

Council wishes to obtain products and services in an open, fair and transparent manner. The Objectives are:

The objectives of this Procurement Strategy are:

- To encourage competitive and efficient markets
- To encourage fair competition
- To attain value for money
- To operate an efficient procurement process
- Where appropriate and aligned consider climate adaption and sustainability

. Develop understanding, agree and embed community expectations for Broader Outcomes and social procurement into procurement and report on progress.

The delivery model appropriate for the Invercargill City Council is the stagedmodel.

This model requires land transport activities to be well defined, low risk and that the scope can be easily defined into contract documents.

The majority of the current and anticipated works (from Council's Roading Asset Management Plan) fits this programme.

Table 7.103 Anticipated Works

Scope	Estimated Cost Range ($)	Procurement Methods	Approval By
	0 – $50,000	Direct appointment	**Delegation Manual**
Minor	$50,000 - $100,000	Closed contest or direct appointment	**Delegation Manual**
Routine	$100,000 – $200,000	Closed Tender	**Delegation Manual, Group Manager**
Major	$200,000+	Open Tender	**Delegation Manual, Chief Executive, Group Manager or Council dependent on Value**
Term Contracts – Roading	**Quality or Price Based**	**Open Contest**	

The roading (and corridor activity) maintenance, operation and renewal programmes will be delivered through several contracts.

The above contracts will be achieved using the supplier selection methods of **lowest price conforming or price quality**.

The price quality weightings will be between the following:

- Physical Works and Professional Services 20/80 to 80/20 ratio
- For Shared Risk Models – the range of attribute weightings can be up to 0/100, namely the initial selection on attribute with price (based on margin or a specified schedule) being negotiated.

Council will consider what the appropriate ratio split is on a contract by contract basis.

In all cases where negotiation or direct appointment is the preferred option, then appropriate documentation will be developed for approving of the Roading Manager which demonstrates the reasoning for selecting a particular ratio.

The Local Government Act requires Council to review the cost effectiveness of service delivery arrangements.

Roading contracted an independent specialist who undertook a Section 17A Review and found the approach to delivery was appropriate. The review which is part of the Road Maintenance Activities Delivery Mechanism Report (Appendix 12).

Smart Buyer Assessment

Council is aware of the Te Ringa Maimoa Self-assessment information and considers it to be well informed and a smart buyer. It sees future development opportunities to progress into different contract forms where it can be shown that the benefits of those approaches give reliability and relative risk to the gains which could be made.

The Smart Buyer Assessment is also included in Appendix 12.

Future collaboration with others including Waka Kotahi is seen as possible so long as all parties enter such discussions with similar objectives.

8. Financial Management

8.1. OVERVIEW

The Local Government Act 2002 requires local authorities to manage their finances "prudently and in a manner that promotes the current and future interests of the community".

This implies compliance with Generally Accepted Accounting Practice (GAAP). Of particular relevance is Financial Reporting International Accounting Standard (PBE IPSAS17) New Zealand equivalent to "Accounting for Property, Plant and Equipment".

In determining how activities will be funded, local authorities are required to take the following into consideration:

- The contribution to the achievement of Community Outcomes (strategic alignment)
- Beneficiaries of each activity (beneficiary / user pays principles)
- The period over which benefits from the activity will occur (intergenerational equity issues)
- The costs and benefits of funding the activity compared to other activities (cost / benefit, prioritisation principles)
- The impact of funding the activity on the wellbeing of the community (ability to pay principles)

Asset Management Plans provide the basis for meeting these requirements for infrastructure based activities.

8.2 FINANCIAL SUMMARY – WHAT THE ACTIVITY COSTS

The following section outlines the budgeted cost, however since Waka Kotahi NZTA co-invests to a significant level in Roading, these costs are also separated out for some clarity.

Council is using a new financial system and has reshaping cost centres from previous plans this new technology is intended to give better alignment with the Council and Waka Kotahi budgeting areas.

Details of individual cost centre level activity are available but not included in the Plan.

Appendix 20 are budgets for activities at the normal management and reporting levels.

Budgets shown include the impacts of inflation over the period of the plan.

8.2.1 Council Funded Programmes (includes Inflation)

Table 8.1 2100_2023 Infrastructure Services Roading Services – Inflated Costings – 10 Years (includes Waka Kotahi funded works)

	2023/24 Annual Plan ($000)	2023/24 Forecast ($000)	2024/25 LTP ($000)	2025/26 LTP ($000)	2026/27 LTP ($000)	2027/28 LTP ($000)	2028/29 LTP ($000)	2029/30 LTP ($000)	2030/31 LTP ($000)	2031/32 LTP ($000)	2032/33 LTP ($000)	2033/34 LTP ($000)
OPERATING												
Rates revenue	8,584	8,584	9,441	10,383	11,419	11,522	12,556	13,556	13,678	14,353	14,989	15,124
Subsidies and grants (Capital)	5,160	5,160	5,095	5,716	5,630	5,705	6,048	6,188	6,318	6,444	6,573	6,698
Subsidies and grants (Operational)	3,763	3,763	3,872	3,957	4,048	4,141	4,233	4,321	4,408	4,496	4,581	4,668
Direct charges revenue	1,325	1,325	1,508	1,583	1,662	1,745	1,833	1,924	2,020	2,121	2,228	2,339
Rental revenue	-	-	-	-	-	-	-	-	-	-	-	-
Finance revenue	141	8	7	7	7	8	9	10	10	11	12	12
Dividends	-	-	-	-	-	-	-	-	-	-	-	-
Fines	-	-	-	-	-	-	-	-	-	-	-	-
Other revenue	-	-	-	-	-	-	-	-	-	-	-	-
Internal charges and overheads recovered	-	-	-	-	-	-	-	-	-	-	-	-
Total revenue	18,973	18,840	19,923	21,646	22,766	23,121	24,679	25,999	26,434	27,425	28,383	28,841
Employee expenses	-	-	-	-	-	-	-	-	-	-	-	-
Administration expenses	72	42	44	45	46	47	48	49	50	51	52	53
Grants & subsidies expenses	-	-	-	-	-	-	-	-	-	-	-	-
Operational expenses	6,910	6,910	7,309	7,540	7,729	7,919	8,099	8,275	8,448	8,624	8,794	8,970
Utilities expenses	743	771	797	817	838	860	882	903	925	947	969	992
Repairs & maintenance expenses	852	852	980	1,001	1,024	1,048	1,071	1,093	1,115	1,137	1,159	1,181
Depreciation and amortisation	12,332	13,590	13,568	14,777	14,887	12,923	12,384	12,497	12,478	13,380	13,053	13,010
Finance expenses	-	31	12	204	475	774	887	984	1,094	1,119	1,122	1,099
Internal charges and overheads applied	1	1	1	1	1	1	1	1	1	1	1	1
Total expenses	20,910	22,197	22,711	24,385	25,000	23,572	23,372	23,802	24,111	25,259	25,150	25,306
OPERATING SURPLUS / (DEFICIT)	**(1,937)**	**(3,357)**	**(2,788)**	**(2,739)**	**(2,234)**	**(451)**	**1,307**	**2,197**	**2,323**	**2,166**	**3,233**	**3,535**
CAPITAL EXPENDITURE - Funded												
• to meet additional demand	-	-	-	-	-	-	-	-	-	-	-	-
• to improve the level of service	341	971	7,601	9,142	8,982	3,325	3,398	3,469	2,955	3,014	3,074	3,132
• to replace existing assets	7,892	8,323	9,083	10,786	11,577	11,769	12,287	13,731	11,996	12,236	12,480	12,718
TOTAL CAPITAL EXPENDITURE	**8,233**	**9,294**	**16,684**	**19,928**	**20,559**	**15,094**	**15,685**	**17,200**	**14,951**	**15,250**	**15,554**	**15,850**
Gross proceeds from sale of assets	-	-	-	-	-	-	-	-	-	-	-	-

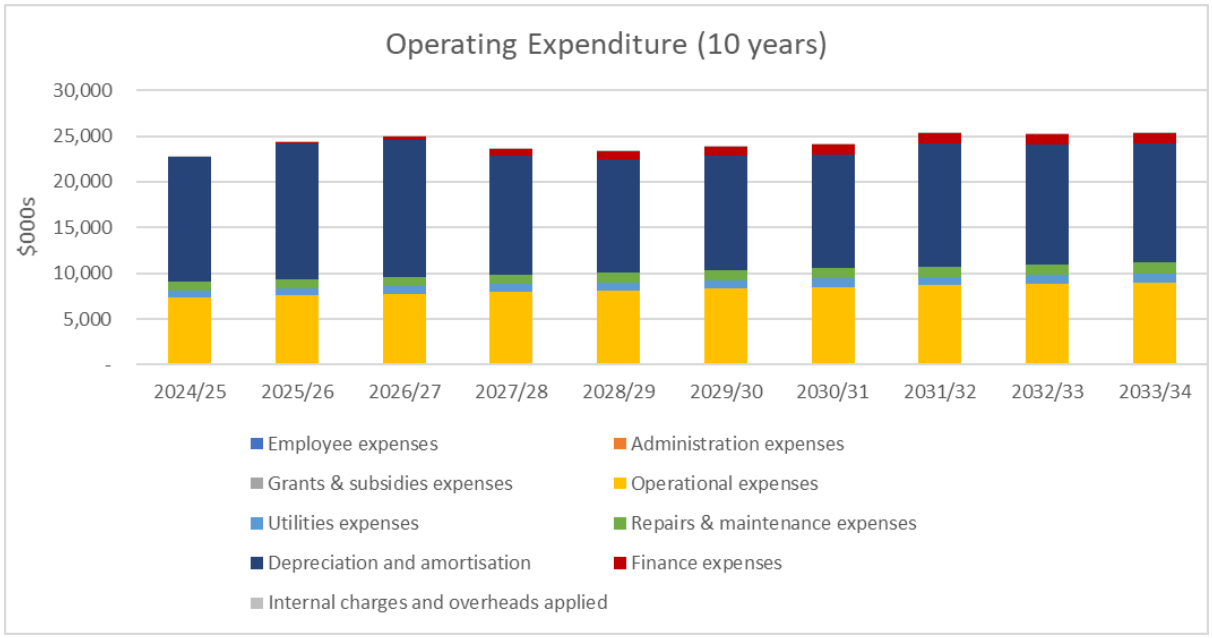
Table 8.2 2100_2023 Works and Services Roading Services – Inflated Costings – 30 Years (includes NZTA Funded works)

	2025 - 2029 LTP ($000)	2030 - 2034 LTP ($000)	2035 - 2039 LTP ($000)	2040 - 2044 LTP ($000)	2045 - 2049 LTP ($000)	2050 - 2054 LTP ($000)
OPERATING						
Rates revenue	55,321	71,700	85,193	103,650	126,107	153,428
Subsidies and grants (Capital)	28,194	32,221	35,554	60,852	82,312	90,879
Subsidies and grants (Operational)	20,251	22,474	24,780	27,360	30,208	33,352
Direct charges revenue	8,331	10,632	13,571	17,319	22,103	28,211
Rental revenue	-	-	-	-	-	-
Finance revenue	38	55	65	71	78	86
Dividends	-	-	-	-	-	-
Fines	-	-	-	-	-	-
Other revenue	-	-	-	-	-	-
Internal charges and overheads recovered	-	-	-	-	-	-
Total revenue	112,135	137,082	159,163	209,252	260,808	305,956
Employee expenses	-	-	-	-	-	-
Administration expenses	230	255	280	308	340	376
Grants & subsidies expenses	-	-	-	-	-	-
Operational expenses	38,596	43,111	47,340	51,807	56,738	62,184
Utilities expenses	4,194	4,736	5,267	5,817	6,422	7,090
Repairs & maintenance expenses	5,124	5,685	6,269	6,923	7,643	8,438
Depreciation and amortisation	68,539	64,418	70,569	68,236	62,976	49,246
Finance expenses	2,352	5,418	5,890	5,890	5,890	5,890
Internal charges and overheads applied	5	5	5	6	10	10
Total expenses	119,040	123,628	135,620	138,987	140,019	133,234
OPERATING SURPLUS / (DEFICIT)	**(6,905)**	**13,454**	**23,543**	**70,265**	**120,789**	**172,722**
CAPITAL EXPENDITURE - Funded						
• to meet additional demand	-	-	-	-	-	-
• to improve the level of service	32,448	15,644	16,627	18,358	20,269	17,723
• to replace existing assets	55,502	63,161	67,666	74,534	82,486	71,958
TOTAL CAPITAL EXPENDITURE	**87,950**	**78,805**	**84,293**	**92,892**	**102,755**	**89,681**
Gross proceeds from sale of assets	-	-	-	-	-	-

Table 8.3 – Capital Expenditure – Planned to be Delivered vs Required to be Delivered – 10 years

	2023/24 Annual Plan ($000)	2023/24 Forecast ($000)	2024/25 LTP ($000)	2025/26 LTP ($000)	2026/27 LTP ($000)	2027/28 LTP ($000)	2028/29 LTP ($000)	2029/30 LTP ($000)	2030/31 LTP ($000)	2031/32 LTP ($000)	2032/33 LTP ($000)	2033/34 LTP ($000)
Capital expenditure required based on age												
• to meet additional demand	-	-	-	-	-	-	-	-	-	-	-	-
• to improve the level of service	341	971	7,601	9,142	8,982	3,325	3,398	3,469	2,955	3,014	3,074	3,132
• to replace existing assets	10,434	10,403	11,354	12,689	12,839	13,052	13,628	15,231	13,303	13,569	13,840	14,103
Total capital expenditure required based on age	**10,775**	**11,374**	**18,955**	**21,831**	**21,821**	**16,377**	**17,026**	**18,700**	**16,258**	**16,583**	**16,914**	**17,235**
Capital expenditure planned to be delivered												
• to meet additional demand	-	-	-	-	-	-	-	-	-	-	-	-
• to improve the level of service	341	971	7,601	9,142	8,982	3,325	3,398	3,469	2,955	3,014	3,074	3,132
• to replace existing assets	7,892	8,323	9,083	10,786	11,577	11,769	12,287	13,731	11,996	12,236	12,480	12,718
Total capital expenditure planned to be delivered	**8,233**	**9,294**	**16,684**	**19,928**	**20,559**	**15,094**	**15,685**	**17,200**	**14,951**	**15,250**	**15,554**	**15,850**

Figure 8.1 Total Expenditure Over 10 Years



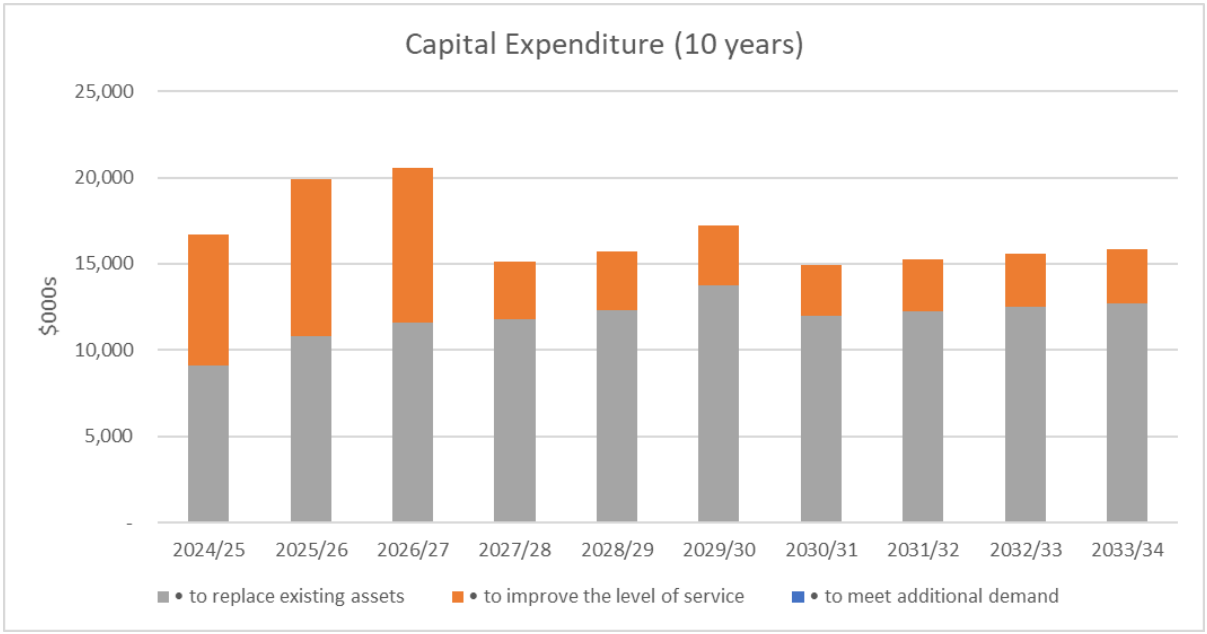
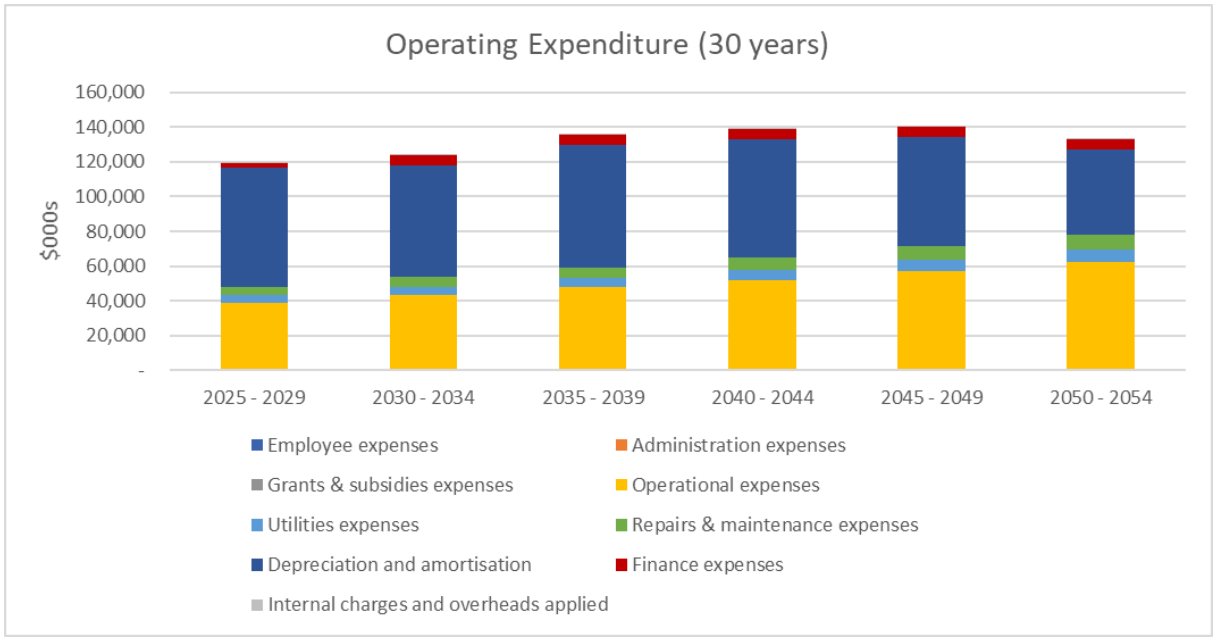


Figure 8.2 Total Expenditure Over 30 Years



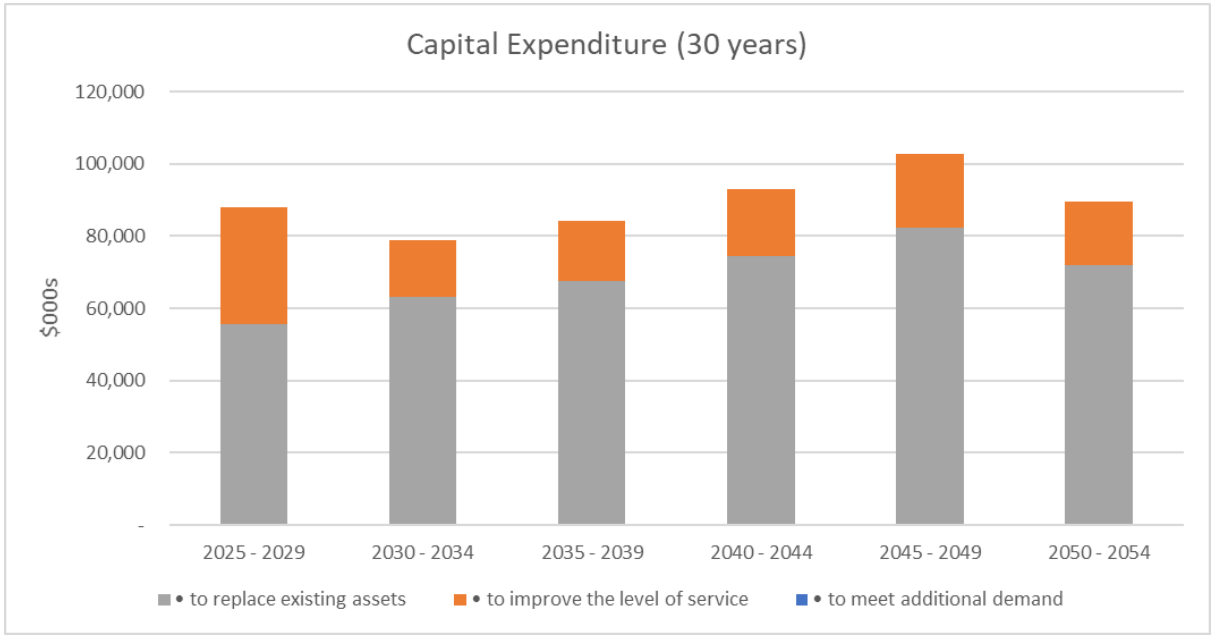


Figure 8.3 Funding Over 10 Years

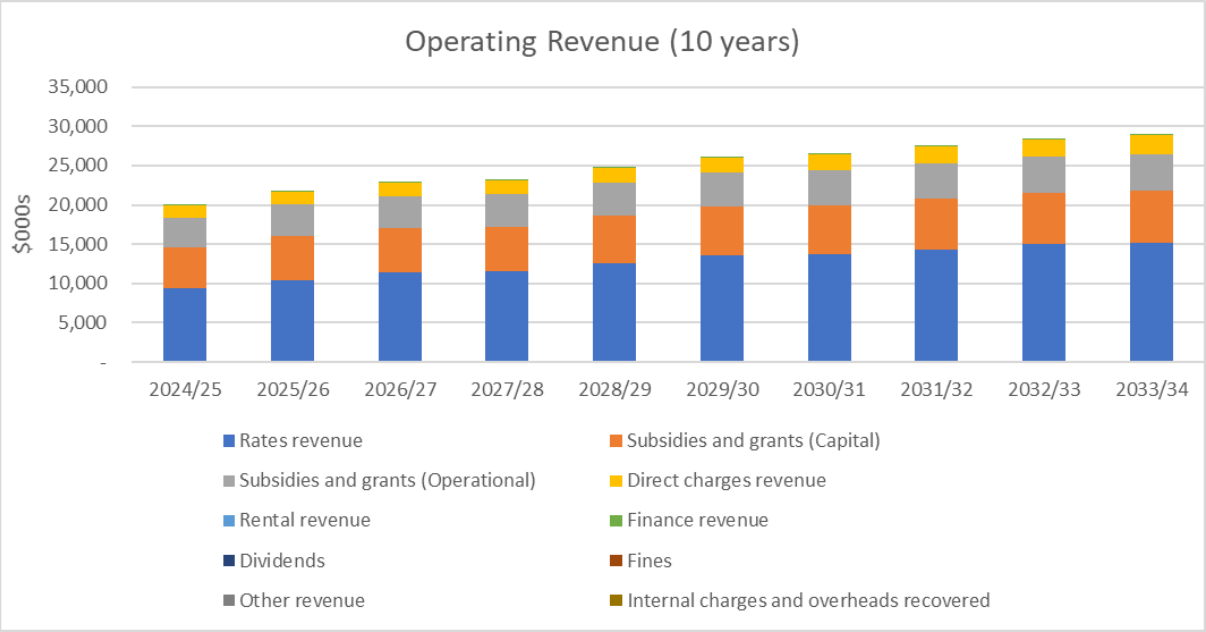


Figure 8.4 Funding Over 30 Years

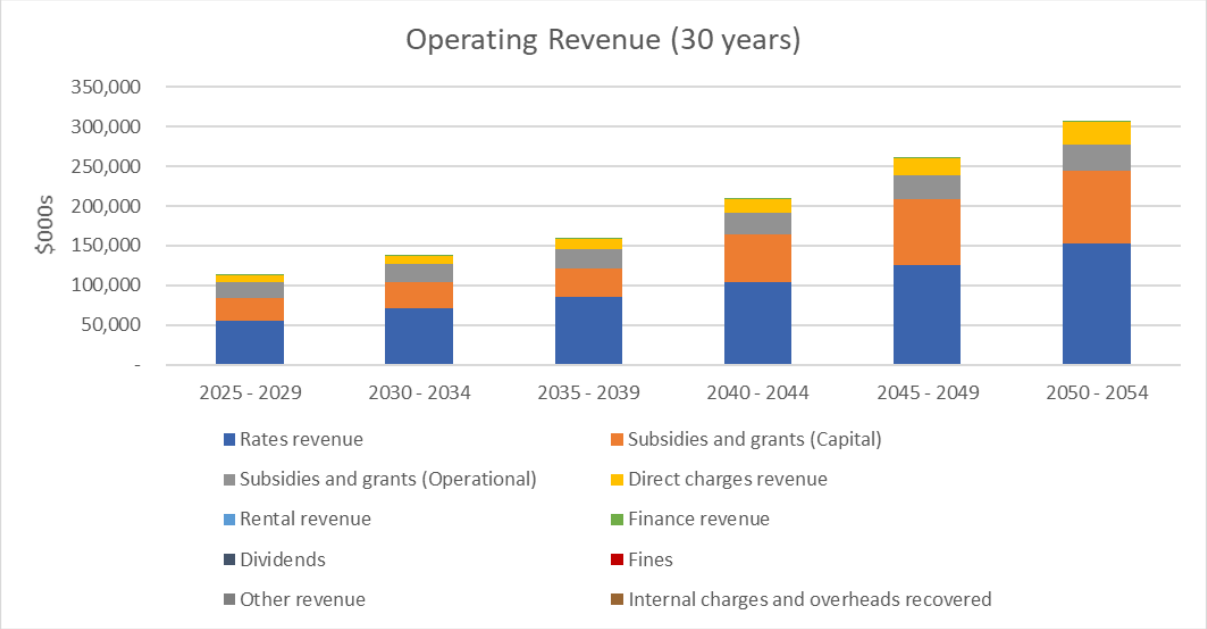


Figure 8.5 Depreciation vs Capital Renewals Over 10 Years

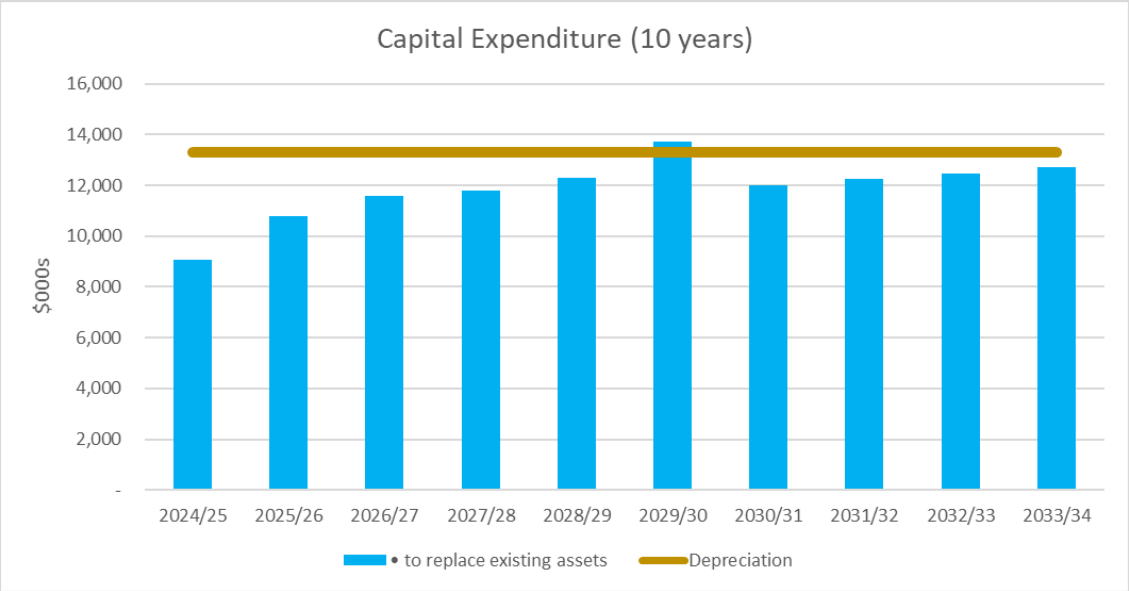


Figure 8.6 Depreciation vs Capital Renewals Over 30 Years

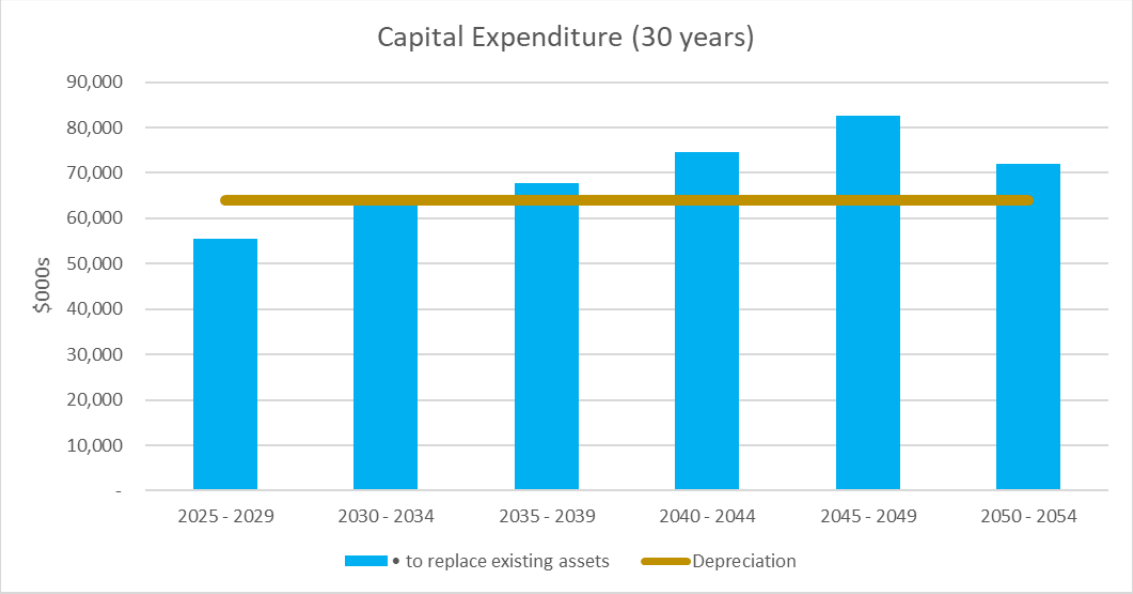
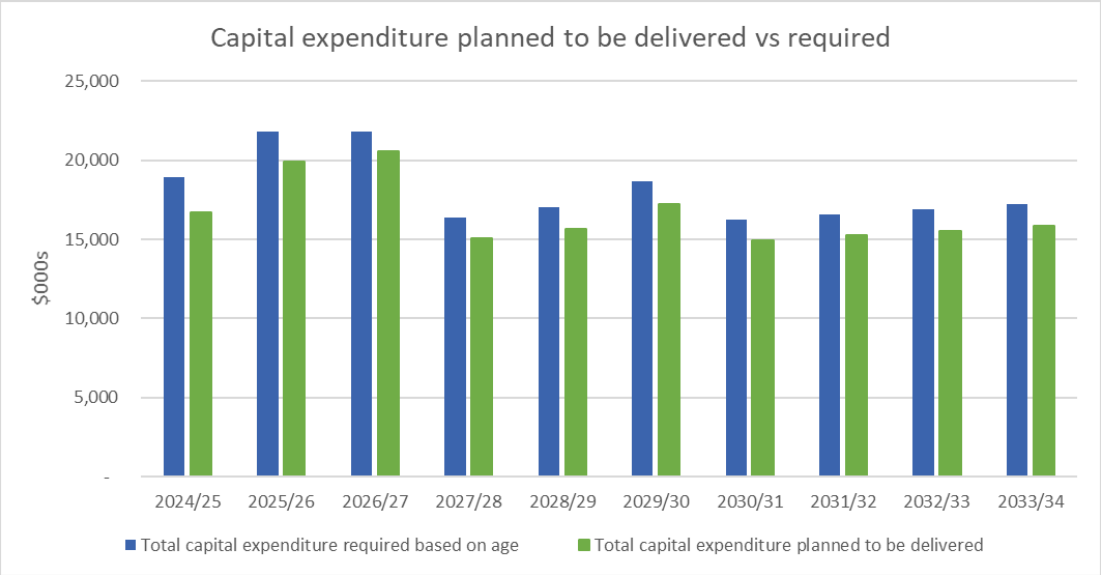


Figure 8.7 Capital Expenditure – Planned to be Delivered vs Required to be Delivered – 10 years



8.2.2 NZTA Assisted Programmes (includes Inflation)

Activity Class	Expenditure Reporting Lines	Work Category	Description	Status	Last Review	Three-year Requested Allocation ($)	2024/25 Approved Allocation	2025/26 Approved Allocation	2026/27 Approved Allocation	Three-year Approved Allocation ($)	Three-year Waka Kotahi Share ($)	Three-year Approved Allocation Previous NLTP ($)
Local road maintenance	Maintain	111	Sealed pavement maintenance	Draft		7,090,000	0	0	0	0	0	6,752,609
		112	Unsealed pavement maintenance	Draft		848,000	0	0	0	0	0	460,760
		113	Routine drainage maintenance	Draft		1,296,000	0	0	0	0	0	1,370,636
		114	Structures maintenance	Draft		514,000	0	0	0	0	0	74,185
		124	Cycle path maintenance	Draft		879,000	0	0	0	0	0	333,552
		125	Footpath maintenance	Draft		1,063,000	0	0	0	0	0	757,324
		140	Minor events	Draft		0	0	0	0	0	0	0
	Sub-total Maintain					**11,690,000**	**0**	**0**	**0**	**0**	**0**	**9,749,066**
Local road maintenance	Operate	121	Environmental maintenance	Draft		1,509,800	0	0	0	0	0	922,931
		122	Network service maintenance	Draft		2,514,000	0	0	0	0	0	2,192,778
		123	Network operations	Draft		404,000	0	0	0	0	0	322,846
		131	Rail level crossing warning devices maintenance	Draft		140,000	0	0	0	0	0	74,363
		151	Network and asset management	Draft		4,153,000	0	0	0	0	0	2,913,552
	Sub-total Operate					**8,720,800**	**0**	**0**	**0**	**0**	**0**	**6,426,470**
Local road maintenance	Renew	211	Unsealed road metalling	Draft		1,110,000	0	0	0	0	0	385,725
		212	Sealed road resurfacing	Draft		19,460,000	0	0	0	0	0	12,615,362
		213	Drainage renewals	Draft		3,453,000	0	0	0	0	0	2,371,883
		214	Sealed road pavement rehabilitation	Draft		4,980,000	0	0	0	0	0	0
		215	Structures component replacements	Draft		716,000	0	0	0	0	0	20,000
		216	Bridge and structures renewals	Draft		0	0	0	0	0	0	0
		221	Environmental renewals	Draft		0	0	0	0	0	0	0
		222	Traffic services renewals	Draft		2,167,000	0	0	0	0	0	1,921,077
		224	Cycle path renewal	Draft		421,490	0	0	0	0	0	0
		225	Footpath renewal	Draft		7,098,000	0	0	0	0	0	3,218,087
	Sub-total Renew					**39,405,490**	**0**	**0**	**0**	**0**	**0**	**20,532,134**
	Total Local road maintenance					**59,816,290**	**0**	**0**	**0**	**0**	**0**	**36,707,670**

Activity Class	Status	Last Review	Three-year Requested Allocation ($)	2024/25 Approved Allocation	2025/26 Approved Allocation	2026/27 Approved Allocation	Three-year Approved Allocation ($)	Three-year Waka Kotahi Share ($)	Three-year Approved Allocation Previous NLTP ($)
Walking and cycling improvements	Draft		450,000	0	0	0	0	0	950,000
Road to Zero	Draft		0	0	0	0	0	0	2,607,745
Local road improvements	Draft		9,705,000	0	0	0	0	0	3,550,000
External funding - CERF - Community connect	Draft		0	0	0	0	0	0	0
External funding - CERF - Transport Choices	Draft		0	0	0	0	0	0	0
External funding - CERF - Improving Bus Driver Terms & Conditions	Draft		0	0	0	0	0	0	0
External funding - CERF - VKT Reduction	Draft		0	0	0	0	0	0	0
Public transport infrastructure	Draft		0	0	0	0	0	0	518,500
Public transport services	Draft		2,500,000	0	0	0	0	0	0
		Total:	**12,655,000**	**0**	**0**	**0**	**0**	**0**	**7,626,245**

The above tables are drawn from the Council's Accounting and Budgeting system and from Waka Kotahi _NZ TIO.

The Waka Kotahi New Zealand Transport Agency requires councils to prepare budgets for submission for the Regional Land Transport Programme (RLTP) which is funded from the National Land Transport Programme (NLTP).

Waka Kotahi co invests with Council at a Financial Assistance Rate (FAR). This rate has been assessed at 51%.

The following table sets out the funding included in Council budgets but arranged in terms of the funding work categories used by NZTA. Further descriptions of these categories can be found at https://www.nzta.govt.nz/roads-and-rail/road-efficiency-group/resources/ .

The data is presented in a different manner but has the same core inputs. The values shown include inflation (approximately 4.0% first year then 2.0% for the balance of the works programme).

Waka Kotahi approve investment in an agreed programme on a three yearly cycle.

Waka Kotahi have a number of processes which are utilised to consider programmes which include frameworks for prioritising programmes such as the Investment Prioritisation Method for the 2024-27 which will replace the current Investment Assessment Framework (IAF). These can be found on the NZTA website.

8.2.3 Programme Implications

Council intend to approve budgets in January 2024.

8.3 FINANCIAL POLICIES

Council must ensure that each years projected operating revenues are set at a level sufficient to meet the years projected operating expenses.

The Revenue and Financing Policy states Council's policy on the funding of its operating and capital expenditure and the sources of those funds.

Council for each activity must give consideration to who benefits from the activity and the appropriate level of private versus public benefit when funding the activity. Public benefit is gained from having access to activities provided by Council. Private benefit is gained from receiving goods or services provided by Council, i.e. a building consent for work carried out by private residents.

8.4 HOW WE PAY FOR THE ACTIVITY

The following sources of funding have been used by Council:

- General Rate
- Fees and Charges
- Other sources of funding
- Loans and Reserves

Council will within the Financial Strategy define how Roading is paid for and the following table is that from 2018-21. Council is considering using general rates rather than targeted rates. This will be updated if the rating policy is changed.

Table 8.6 2018-2021 Road Funding[40]

Community Outcome	Period of Benefit	Who Benefits	Funding Sources and Proportion	Demand Generators
Roading				
One Community – Our youth, older people, different neighbourhoods and communities' basic needs are met, and they feel valued and proud to live here. A vibrant, safe city centre which meets our people's diverse cultural needs. A future focused economy delivered through innovation and partnership and supported by appropriate infrastructure. A healthy, resilient environment where the city is well positioned to navigate climate change.	**Long**	***Public*** Ability to travel effectively, efficiently and safely through the district. ***Private*** Parking meters – ability to park.	General rates 50-65% Fees / Charges 0-15% Other Sources inc Waka Kotahi 30-40%	Change in vehicle ownership and number of trips. Change in accessibility to property such as Industrial.

Funding for Roading Activity 2024-2034

Activity	Source of Funding				
	User Charges / Fees	Subsidy	General Rate	Targeted Rate	Loans
Operational	✓	✓	✓		
Capital		✓	✓		✓

[40] This will be confirmed once feedback is received from Waka Kotahi and the Financial Strategy is finalised.

8.5 ASSET VALUATION FORECASTS

8.5.1 30-year Valuation and Depreciation Forecast

Roading infrastructure assets are classified as specialised operational assets according to the definition in PBE IPSAS 17 (Public Benefit Entity International Public Sector Accounting Standard 17 Property, Plant and Equipment). It states that optimised depreciated replacement cost is the most appropriate valuation methodology for infrastructure assets.

The valuation of infrastructure assets was carried out as at 30 June 2022 using the optimised depreciated replacement cost valuation method. The valuation figures presented have not been inflated to 30 June 2023.

The RAMM Asset Valuation module is used in this valuation for all the roading assets. Depreciation on a straight line basis is provided on roading assets, except land, berms, shoulders and formation of roads to allocate their cost (less residual value) over their expected useful economic life.

The results of this valuation were independently audited by IAM Consulting Limited.

The summaries of asset valuations are shown below with the full report (Appendix 13) and IAM Consulting Limited review (Appendix 14) attached.

Table 8.7 Summary of Asset Valuations

Asset Group	Replacement Cost	Depreciated Replacement Cost	Annual Depreciation	Quantity
Topsoil removal - Rural	$691,243.37	$691,243.37	$0.00	345756 m3
Topsoil removal - Urban	$1,053,621.89	$1,053,621.89	$0.00	562729 m3
Excavation layer - Rural	$9,065,148.26	$9,065,148.26	$0.00	723137 m3
Excavation layer - Urban	$14,681,188.84	$14,681,188.84	$0.00	1081629 m3
Total Road Formation	$25,491,202.36	$25,491,202.36	$0.00	
Pavement layer- Urban	$100,743,893.29	$29,126,072.23	$1,237,915.89	994656 m3
Pavement layer - Rural	$72,144,901.05	$25,148,188.65	$839,017.94	556671 m3
Total Pavement layers	$172,888,794.34	$54,274,260.88	$2,076,933.83	
Top Surface	$62,547,123.84	$12,303,389.86	$3,124,142.39	861315 m2
Shoulders	$6,142,809.84	$2,006,727.35	$80,777.70	476636 m2
Berms	$12,113,597.00	$12,113,597.00	$0.00	135295 m2
Total Roadway assets	$80,803,530.68	$26,423,714.21	$3,204,920.09	
Sign	$1,604,156.31	$414,334.52	$93,549.49	9947 Nos
Sign Post	$928,312.46	$301,019.92	$43,089.41	6116 Nos
Traffic Signs	$2,532,468.77	$715,354.44	$136,638.90	
Street lights and lamp	$6,156,403.67	$4,460,511.55	$303,780.76	7155 Nos
Street light poles	$15,796,585.18	$10,005,610.61	$315,174.04	4510 Nos
Street light brackets	$3,236,201.36	$1,445,571.87	$64,666.68	6967 Nos
Street Lights	$25,189,190.21	$15,911,694.03	$683,621.48	
Sub Total	$306,905,186.36	$122,816,225.92	$6,102,114.30	
Other Assets				
Bridges	$87,099,177.12	$43,154,034.43	$881,175.59	12882 m2
Bus Shelters	$697,424.23	$366,492.30	$17,022.11	57 Nos
Crossings	$17,522,066.03	$4,813,699.69	$469,333.60	20126 Nos
Drainage	$29,813,963.18	$11,045,480.65	$357,850.99	Refer S3.11
Street features	$1,958,450.38	$610,812.71	$73,055.96	148 Nos
Footpaths	$92,323,839.10	$38,471,708	$2,260,882	890529m2
Surface water channels	$135,170,382.16	$46,385,385.32	$1,719,590.48	776844 m
Rubbish Bins	$267,622.94	$16,947.25	$13,124.15	128 Nos
Road Markings	$92,828.00	$14,248.40	$14,248.40	4036 Nos
Traffic Islands	$1,121,208.00	$729,828.00	$37,374.60	115 Nos
Other Assets Total	$366,066,961.14	$145,608,636.75	$5,843,657.88	
Minor Structures				
Riprap Tiwai causeway	$6,152,317.00	$2,953,112.16	$61,523.17	1 Nos
Core - Tiwai causeway	$5,335,066.00	$5,335,066.00	$0.00	1 Nos
Bridge approaching ram	$1,774,328.25	$958,137.26	$17,743.28	1 Nos
Minor Structures Total	$13,261,711.25	$9,246,315.42	$79,266.45	
Traffic Facility				
Parking meters	$742,559.18	$618,084.19	$71,320.03	92 Nos
Edge marker posts	$152,173.14	$15,920.79	$8,146.91	5667 Nos
Traffic Facilities Total	$894,732.32	$634,004.98	$79,466.94	
Traffic Signals				
Attachment	$73,381.74	$35,300.48	$2,935.27	190 Nos
Target board	$76,821.51	$25,394.36	$3,841.08	194 Nos
Cables	$480,688.00	$135,803.82	$19,227.52	127 Nos
Controller	$826,656.84	$278,906.83	$33,066.27	23 Nos
Lantern	$1,179,460.90	$726,127.02	$47,178.44	406 Nos
Traffic Loops	$237,545.93	$35,631.89	$11,877.30	119 Nos
Ped call box	$159,813.38	$52,544.80	$6,392.54	144 Nos
Signal poles	$624,323.97	$274,970.80	$24,972.96	178 Nos
Traffic Signals Total	$3,658,692.27	$1,564,680.00	$149,491.38	
Sub Total	$383,882,096.98	$157,053,637.15	$6,151,882.65	
Grand Total	$690,787,283.34	$279,869,863.07	$12,253,996.95	

8.6 PROCUREMENT

Council is required to have a Procurement Strategy for activities funded through the National Land Transport Programme which has been approved by Waka Kotahi New Zealand Transport Agency, in order to meet the requirements of Section 25 of the Land Transport Management Act 2003.

Council has an endorsed Procurement Strategy which establishes Council's approach to procurement of activities funded through the National Land Transport Programme (NLTP). Planned expenditure on subsidised Transport Activity is in the order of $25 million per annum.

The strategy sets out the strategic approach to procurement over the 2022-2025 years, the context within which Council purchases goods and services, and details the programme to be purchased and the methods that will be used to do this.

The Procurement Strategy aims to achieve desired outcomes and quality at the lowest overall whole of life cost and sustain a pool of suppliers in the region of varying sizes and capabilities to meet the needs of the Council.

This Procurement Strategy should be read in conjunction with the Council wide Procurement Policy, noting that this Strategy takes precedence with respect to NZTA funded projects, and should comply with the NZTA Procurement Manual. Additional guidance is also provided from MBIE for standard guidance to purchase goods and services.

The Principles of the Procurement Strategy are:

1. To encourage competitive and efficient markets
2. To encourage fair competition
3. To attain value for money
4. To operate an efficient procurement process
5. Where appropriate and aligned consider climate adaption and sustainability
6. Develop understanding, agree and embed community expectations for Broader Outcomes and social procurement into procurement and report on progress.

Maintenance contracts in the past provide a balance between price and quality, and use either Prequalification or Price / Quality supplier selection methods.

The methods used to procure capital projects will differ depending on the size of the project, but will be Lowest Price or Price / Quality.

Professional services are externally sources are be procured following the guidelines of the Waka Kotahi NZTA Procurement Manual.

A Smart Buyer Assessment has been undertaken and included in Appendix 12.

Council's score of 64 suggests our Council has embraced the Smart Buyer principles but can still improve (2021 of 62, 2020 of 61, and 2017 of 59). Key improvements are better liaison with the industry and stronger governance understanding and alignment with Smart Buyer approach.

RCAs must be both efficient and effective managers of their road assets and smart buyers of the services they require. These issues strongly relate to the concept of 'smart procurement' with a balanced focus across:

9. **Economy** – through securing (or supporting) the provision of products, materials and expertise at the quality, in the volumes and at the times and locations required, at the lowest price.
10. **Efficiency** – through the processes used, including standard documentation and contracting forms selected for achieving best cost / quality and outcomes; and knowledge of the product / materials and supplier market applied.
11. **Effectiveness** – taking opportunities for changing from traditional products and materials by maintaining support for innovation in the nature and characteristics of products and materials, and for a strong supplier market.

The impact of raising the capability will include reduced supplier selection process costs, better management of risk and more objective assessment of performance for use in future supplier selection processes.

The contracting industry has provided useful analysis of the characteristics of a smart buyer. Smart buyers have:

- An improved understanding of costs that better inform their decision making process
- An understanding of the impact delivery models and supplier selection criteria can have on the value of contracts
- Robust forward work programmes that are communicated to the industry and supported by budgets that allows the work to be completed
- Knowledge of the network to determine treatments required based on physical evidence and supported by knowledge of the costs involved
- In house expertise that aids the decision making process and allows acceptance of innovative solutions possibly with or without the involvement of consultants
- A clear understanding of risk and how it is allocated and managed
- An understanding that lowest price will not always deliver desirable outcomes
- An understanding that being prepared to pay more may result in enhanced whole of life value for money

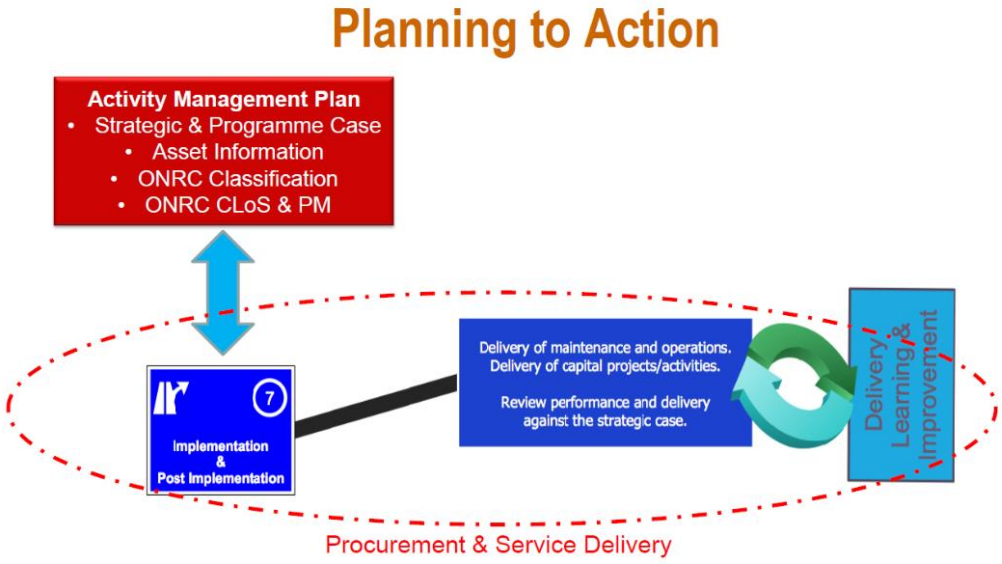
Future contract models are likely to move towards Advanced Models and build stronger relationships with contractors through shared risk, better contract delivery and targeted pricing.

These models change the way the contracts are bid and paid for, with typically an overhead and profit margin paid over the actual cost of the work. The Contracting Team need to work closely on relationship and develop ways to improve services to customers and demonstrate in an open way that they meet and exceed the community expectations. This change will be transitional and need new skills on all teams and stronger understanding at a governance level.

The following highlights a process of using the AMP and how it translates into service delivery. (Source Reg 1 The Road Efficiency Group)

Figure 8.7





Well managed procurement of works and services will contribute to Council's community outcomes and key transport objectives.

Council's Procurement Strategy will assist in achieving best value for money procurement. Quality procurement will assist with a healthy environment through ensuring high standards of environmental protection when undertaking physical works.

A well-functioning Procurement Strategy will also assist Council to work co-operatively and to co-ordinate procurement programmes with adjoining Council and obtain best value for money.

Some aspects which must be carefully monitored are:

- Awarding contracts predominately based on price – with little appreciation of any risk to best value for money
- Outsource work to the detriment of asset knowledge
- Choose contract forms that are fashionable, not well understood and poorly managed
- Lack technical and contractual management skills
- Lack asset management skills that prevent the development of robust forward work programmes
- Do not support forward work programmes with appropriate budgets

A 'smart buyer', RCA ensures its staff are up-to-date, regularly shares best practice experiences with colleagues from other agencies. It supports and resources their teams appropriately in the recognition that getting the strategic direction right is a very small cost compared to the consequence of getting it wrong. This requires staff to be involved in regular training, attendance and participation in sector gatherings, and involvement in NZTA investigating teams and the like.

Key Message – Procurement

- Council must continue to develop greater knowledge on Procurement.
- Future procurement is likely progress towards advanced models with stronger relationships and a strong contractor market.

- Training and knowledge is required including and importantly at a Governance level.

8.7 CONFIDENCE LEVELS IN PROGRAMMES

The confidence levels utilised for financial information is as follows:

Table 8.8 Confidence Levels in Programmes

Confidence Grade	General Meaning
A	Highly Reliable **Data based on sound records, procedures, investigations and analysis which is properly documented and recognised as the best method of assessment. Dataset is complete and estimated to be accurate ± 2%.**
B	Reliable **Data based on sound records, procedures, investigations and analysis which is properly documented but has minor shortcomings, for example the data is old, some documentation is missing and reliance is placed on unconfirmed reports or some extrapolation. Dataset is complete and estimated to be accurate ± 10%.**
C	Uncertain **Data based on sound records, procedures, investigations and analysis which is incomplete or unsupported, or extrapolation from a limited sample for which grade A & B data is available. Dataset is substantially complete but up to 50% is extrapolated data and accurately estimated ± 30%.**
D	Very Uncertain **Data is based on unconfirmed verbal reports and / or cursory inspection and analysis. Dataset may not be fully complete and most data is estimated or extrapolated. Accuracy ± 40%.**

Confidence Grading System

The confidence levels and areas of uncertainty of major assets categories are shown below. Council had AECOM consider the data confidence within Council in 2017. A review will be undertaken in 2024 to ensure that the data continues to be robust and consistent as with the previous periods. Internal reviews were undertaken and considered as part of the valuation exercise. Data is also provided to Waka Kotahi annually. Tools such as Te Ringa Maimoa - PMRT also show peer group comparisons which would highlight any wide spread concerns.

The overall Assessment is shown as follows (and includes other assets to demonstrate how the relativity). Source AECOM Assessment 2017.

Table 8.9 Confidence Levels and Areas of Uncertainty of Major Assets Categories

Assessment Element	Buildings	Parks & Cemeteries	Roading	Three Waters
Completeness of records	B	B	A	A
Attribute details	A	B	A	A
Asset hierarchies	C	B	A	B
GIS representation	N/A	D	B	A
Condition information	B	C	A	C
Maintenance history	B	B	A	B
Overall assessment	**B**	**B**	**A**	**B**

The internal review (2020) of the asset grouping within Roading is also assessed as below:

Table 8.10 Relative Asset Grouping within Roading

	Confidence Level				
Assets Type	**A**	**B**	**C**	**D**	**Potential effect of the uncertainty on the financial estimate**
Pavements	√				Pavement strength data is estimated value for most of the roads which may be overestimated or under estimated. Modelling and other advanced techniques support confidence levels. Most construction dates (key data) is well known.
Top Surface	√				Most of the top surface data has been updated with annual resealing programme. Modelling and other advanced techniques support confidence levels.
Kerb and Channel		√			Confidence is high for the asset quantity and regular inspections are undertaken and programmes formed, network wide condition is an improvement area and a field validation programme is planned.
Footpaths	√				Most of the footpath data has been updated with renewal programme. Condition of the footpath is rated by condition rating survey.
Bridges	√				Reliable and limited uncertainty as regular bridge inspection, detail bridge inspection and regular maintenance activities provide reliable information of bridges.

The overall confidence level at asset component level is “A – Highly Reliable”. This aligns to the AECOM 2017 report.

The assessment is now dated and confidence levels are at risk of being overstated, as staff has been consistent it has been assumed that there is still good reliability and there are not likely to be significant financial uncertainties. This will ascertained in the 2024 review.

It is expected that roading estimates will not be significantly (<10%) outside the works required.

Council undertakes a number of regular inspections and ratings of the asset groups to continue condition rating within RAMM such that programmes and valuations can be effective.

Key Message – Confidence Levels

- Roading data has been captured and stored in RAMM for over 30 years and has matured.
- Advanced modelling techniques are used with this data and these are field validated (e.g. surfacing) giving high confidence in programmes, budgets and lives.
- Budgets are developed from current contract prices.
- New procurement approach may introduce less certainty but has greater control on work quantity and quality.

8.7 RELIABILITY OF FINANCIAL FORECASTS

8.7.1 Revenue Forecasts

The revenue forecasts for the Plan are based upon the financial assistance rate expected to be received from the New Zealand Transport Agency. This has been confirmed for the 24-27 NLTP.

The investment from Waka Kotahi is a key area for income for Council and has previously been in the order of $8.7-$9.7 million annually (depending on if any specific projects are commenced, e.g. Stead Street).

8.7.2 Operational Forecasts

The Operational costs are typically internal charges which Council has some degree of input into and are not seen as a significant risk area for Roading. The processes within Council are changing for internals but the level of cost should not change.

Renewal works are funded from rates rather than loans and are not as impacted by interest rates on loans.

8.7.3 Maintenance and Renewal Forecasts

The maintenance and renewal costs for the activity have the largest component financially area and have an 'A – Highly Reliable' grade. These costs are well tested in the market (for contracts of previous scope and years) and / or contracted where the rates are certain. Given the volume and extent of the work, there is opportunity to manage the activities within the allocations with the use of prioritisation and careful contract management.

The following also provides some input into the details from which the budgets have been developed, particularly for renewals:

Year 1-3	The scope and pricing of work is considered reliable.
Year 4-10	Increasing uncertainty around scope and detail of work – forecast estimates considered conservative but less reliable than Years 1-3.
Year 11-30	Order costing based on estimated quantity of work, forecasts could change significantly with further investigation.

The rates are also escalated by factors including inflation via the Waka Kotahi maintenance indices.

8.7.4 Development Forecasts

Development forecasts are related to the Low Cost Low Risk area based on conceptual ideas and consequently have Grade C reliability. This is because until the project has some detail and certainty created, the costs are estimated.

8.8 SUMMARY OF PROGRAMME ASSUMPTIONS

Table 8.11 lists the key assumptions have been made in preparing the 30 year cash flow forecast:

Table 8.11 Programme Assumptions

Assumption	Level of certainty	Impact of uncertainty on Financial Programmes	Proposed approach to managing the uncertainty
STRATEGIC			
The Government Policy Statement for Transport (GPS) will provide a stable direction in the years to come	Reliable	If GPS changes significantly, there will be financial impacts on budgets and what the focus of activity plan should deliver. E.g. Footpaths not subsidized.	Continue dialogue with Waka Kotahi NZTA Respond to opportunities for feedback to MOT Keep political parties informed
ASSET PARAMETERS AND NEEDS			
Useful lives and remaining lives of the asset groups will improve and continue to be reliable.	Highly Reliable	Asset lives are a key input into programmes and modelling. There are many assets so if a small [percentage are of low certainty this will not impact the overall outcome of modelling	Continue to collect and evaluate and improve data. Record new information at source and review accuracy ongoing.
Assets will be capable until their asset life is completed. Detailed evaluation of asset renewal requirements is one of the bigger costs for infrastructure and needs ongoing development. Assumptions relating to lives are tested regularly and projects are only undertaken at the right time and reserves are established to ensure that the risk can be mitigated adequately to spread that risk over periods of sufficient length to allow the community to fund them	Reliable	If assets fail early then programmes may need to be adapted to fit within existing funding allocated. Again if one asset fails outside the norm this will only have a limited impact. Within groups such as bridges there will be more risk considered due to the number of assets and the weighting to one structure (e.g. Tiwai)	Ongoing review of data and condition assessments where appropriate.
Policies are adopted for areas such as AC Renewal to align to the Plan Strategy for delivery	Highly reliable	Policy is one of the inputs into the decision making process	Regular policy review. Workshops with Councillors where required. Ongoing public conversations and inputs
Asset renewal requirements will follow JunoViewer modelling and the assets will respond as predicted	Reliable	Funding available via NLTP will impact the programmes	Continue dialogue with Waka Kotahi NZTA Respond to opportunities for feedback with Councillors

DEMAND / TRAFFIC			
Changing population demographics and technology will increase demand for mobility solutions, however asset availability and core service delivery are unlikely to be significantly affected.	Reliable	Rate of change currently not significant so impacts of low order. Long term changes to areas such as footpaths will need planning and could have more significant impact (e.g. footpaths need to be 2.4m wide)	Ongoing awareness of national direction on use of changes in access and mobility. Community conversations
Freight and the traffic still use the traditional roads.	Highly reliable	Impacts are a long term impact	Management of heavy traffic uses
Traffic weight loadings are managed to extend pavement lives aligned to modelling	Highly reliable	Impacts are a long term impact	Management of heavy traffic uses
Growth of assets from sub-divisional development (given the anticipated slight increase in population of the district) has been considered but will not have a significant impact on maintenance demands.	Highly reliable	Planned subdivisions will be of a high standard and have time for planning of demands	Good standards for development of assets
Mode shift will not change demands beyond the capabilities of the footpath facilities	Highly reliable	Change will be slow	Ongoing awareness of changes
The community will engage in mode shift and non-vehicle travel trips will grow as climatic awareness grows	Highly reliable	Change will be slow	Ongoing awareness of changes
SAFETY			
Visitor numbers do not adversely influence the road safety issues and will return to pre Covid19 levels by 2022.	Highly reliable	Traffic issues appear independent of visitor drivers.	Review of data as it is available and trending
An improvement in all modes safety will occur in Invercargill before 2030 and residents will agree investment in their safety is a priority	Highly reliable	Change will be slow	Monitor and respond as changes required
TECHNOLOGY			
Technology will not develop and significantly change the asset focus or requirements.	Highly reliable	Funding not reliant on technology currently	Monitor and respond as changes required
Significant numbers of autonomous vehicles will be developed and introduced into the traffic fleet improving safety but not until 2037 or later.	Reliable	Roads will still be required for term of plan	Monitor and respond as changes required
E-Bikes and Escooters will become affordable and a choice of travel to school by 2030.	Highly Reliable	No impact as roads have capacity and a cycling network in place.	Monitor and respond as changes required
Safety features will be introduced in affordable mainstream vehicles by 2027.	Uncertain	New vehicles will have improvement but may not widespread	Monitor and respond as changes required

FINANCIAL			
Budgeted expenditure and Revenues are available over the period and Waka Kotahi funding continues at levels assumed	Reliable	Programmes may need to be changed if funding not available and in longer term level so service changes could be required.	Monitor and respond as changes required
All expenditure is stated in dollar values as at 1 July 2023, with allowance made for inflation over 30 year planning period is noted where shown	Reliable	Inflation at current low level and plan is reviewed every three years.	Monitor and review for each plan.
Maintenance allocations will be sufficient to meet the assets needs.	Reliable	If funding is not available, prioritization will be required and focus on ONRC category will be required for maintain key assets.	Review three yearly and focus on key issues
Renewal programmes are committed to once agreed and delivered otherwise Maintenance budgets need to be suitably increased.	Reliable	Budgets set on three year cycle by Waka Kotahi	Monitor and respond as changes required
PROCUREMENT MARKET			
It is expected that a stable and consistent contracting market will continue to operate with competition and effective contractors within the assumptions of the plan.	Reliable	If contractors leave the market the financial impacts at tender time will be significant	Select suitable procurement strategy for tasks. Ongoing supplier market review
Contractors will want to work with Council and their modal of delivery is suitable for a constructive environment.	Reliable	Financial impacts will increase if insufficient bidders or contracts not in place (long term)	Select suitable procurement strategy for tasks. Establish working relationships Ongoing supplier market review
Smart Buyer options for contracts will be used, focused on what is best for Invercargill in providing maintenance and projects.	Reliable	Impacts reduced with appropriate procurement strategy and contracts	Improve capability in procurement and monitor market
Council will progress to an advanced procurement model for maintenance.	Reliable	Ongoing review of best approach to reduce risks and impacts required.	Improve capability in procurement and monitor market

Key Messages – Programme Assumptions

- Funding is available at the required levels to deliver programmes.
- Contractors and the model of delivery are stable and work effectively.
- Changes in technology and modes of transport can use current assets without significant change.

9. DELIVERING AND MONITORING THE PROGRAMME

9.1 PROGRAMME GOVERNANCE AND REPORTING

Council operates on a four-weekly cycle with meetings being on a Tuesday of each week, Week One – Infrastructure Committee, Week Two - Community Wellbeing Committee, Week Three alternates between Finance and Projects Committee and Risk and Assurance Committee with Week Four being Council. The Committees and Council monitor and consider reports on levels of services for activities and assets alongside monthly financial accounts for each department. Members question these reports with Managers present to answer any questions that arise from the reports.

The information for and from these reports is entered into Councils systems where appropriate. This monitors the performance both fiscal, and service based against targets and budgets from Council's Long-term Plan. Targets can be key performance indicators, internally driven targets or provided from a Ministry that oversees that area, i.e. Department of Internal Affairs. At a full Council meeting these reports are then received and performance monitored quarterly.

Frequency of Review

Every financial year Council prepares an Annual Report that is the key document in ensuring the expenditure for the year was efficient and is pertinent in ensuring accountability to the community and ratepayers.

The Annual Report does not just show the current financial status, but also shows the levels of service for all Council activities and assets measured against the yearly targets set in the Long-Term Plan. These are measured and reported quarterly in the Council meetings. The Annual Report is a holistic overview of their performance.

Figure 9.1 Programme Governance and Reporting



The Council consists of the Mayor and 12 Councillors and its role is to provide and maintain services and amenities for the public of Invercargill.

The role of Māori, and Kāi Tahu (Ngāi Tahu), as Takata Whenua, as represented by Waihōpai Rūnaka and Te Rūnanga o Awarua, as a partner of Council is recognised.

Mana Whenua representatives for both Waihōpai Rūnaka and Te Rūnanga o Awarua are on Council standing committees. This has enabled Mana Whenua to have a voice as part of decisions across the wide range of business which Council has undertaken over the year.

The Chief Executive role is reviewed every five years. In addition to this, Council undertakes a Representation Review every six years to ensure that the community is aware and accepting of the current Council structure.

Council develops their Long-Term Plan every three years in line with their obligations under the Local Government Act 2002. Every year following this, Council will adopt an Annual Plan which will make any amendments to the existing Long-Term Plan and allows for members of the community to submit on this process.

Further, Council will provide an Annual Report, which is a full year financial snapshot of Council's activities for that financial year. This is also compared to the financial projections in Council's Long-Term Plan.

9.2 STAKEHOLDER ENGAGEMENT AND COMMUNICATIONS

Council has a number of ways where the community are engaged with information on projects or on bylaws and other regulatory functions and these include:

- Reports to Council Committee Meetings
- Attending Community Board Meetings
- Meeting with Councillors and Community Board chairpersons.
- Performance Monitoring in Council agendas
- Letters to residents effected by works
- Letters to residents requesting actions or information
- Face to Face meetings with residents
- Telephone conversations with residents
- Responding to Facebook questions
- Email or letters responding to RFS request through Council websites
- Meetings and presentations with Community Groups
- Advertisements on Councils Community Noticeboard (in local paper)
- Messages on Council website and Facebook (Word on the Street)
- Conversations with families and friends
- Attendance and participation at Regional Transport Committee
- Attendance and participation at Technical Advisory Group of the RTC
- Forum and conference attendance (Te Ringa Maimoa and other Technical Groups)
- Presentation to other professional groups

The formal communication of performance is delivered through four weekly committee reports and via the annual report.

Each project has its own specific needs to communicate and Council is continuing to develop ways to communicate better with our stakeholders and target audiences.

The Local Government Act 2002 states specific methods of consultation to be utilised by Council for certain processes and where these are required they are followed such as in road stopping or bylaw consultation.

9.3 BUSINESS PROCESSES

Council staff operates under a Delegations Register (Appendix 15) that is adopted by Council; this Register lists every department with specific delegations that are required under legislation or Council policies so that staff members are able to carry out their specific job requirements.

Roading Specific Processes

Most costs for roading come to charge via a contract claim prepared by the contractor and submitted electronically via RAMM on a shared management platform.

Each task is assigned a dispatch created through the contract which follows through the management process and links to key assets giving whole of life information.

The road maintenance contract is a shared risk based model of 3910 with a collaboration agreement "The Waihopai Alliance". This contract is different in that work programmes are agreed between ICC and the contractor (Fulton Hogan). This programmes are then delivered on a labour and materials cost plus basis. This has given ICC much better transparency of programmes and budgets.

All other contracts have a strong element of measure and value approach, and the costs are established by the contractor inputting the quantity of work. Some items used are lump sum. Each procurement is considered on the best value for money and aligned to the roading strategy.

Claims need to have confidence that they are appropriate and internal checks are made to validate claims.

The processes are robust and is fully trackable and has audit facilities in the software. NZTA undertake Financial and Procedural Audits.

Financial Summary Costs for Roading are prepared on a monthly basis with an accrual of the contract costs and a set of financial statements from which Waka Kotahi claims are considered and then made. These are available by the 5th business day, giving early visibility of monthly costs. This is followed by the actual costs following the 20th of the month business run.

This process has been established to control and understand costs rather than wait a further three weeks for the actual costs.

This ensures Waka Kotahi claims are timely and accurate. Accruals are possible as contractors claims are lodged for claim via RAMM within three business days.

The current accounting system is being updated and the processes will be developed.

RAMM is a common platform between Council and Contractor, and greater cost transparency is available.

Quarterly Financial reports are provided to the appropriate Committee and to Council. These accounts are at departmental levels with further detail being available upon request.

Council's new systems will look to add additional value to these processes but most of the value lies within the joint operational platform of RAMM linking to assets for analysis. These systems are not typically available to other assets groups.

9.4 INFORMATION SYSTEMS AND DATA

RAMM

RAMM is a software product of RAMM Software Limited and has been benchmarked as the national road asset management software system for over 25 years. Recently the company has been sold to international owners.

The RAMM inventory system provides a comprehensive suite of data management tools for pavement, footpaths, kerb and channel, bridges, street lights, signs, crossings, features, traffic facilities and storm water drainage assets.

RAMM stores:

- Roads condition data collected from visual assessments of pavements, kerb and channel and footpaths.
- Roughness data from Roughness survey
- SCRIM skid resistance data from SCRIM survey
- Pavement strength, traffic volume and traffic composition data
- GIS output and reporting

ONRC and ONF classifications are stored in RAMM as the primary source.

Asset Inventory

RAMM comes standard with many asset types that can be prescribed for the network. Additionally, user defined assets can be defined if the standard set is insufficient.

Asset Valuation

Council uses the RAMM Asset Valuation module to calculate and store RC, DRC and annual depreciation values. The software is accepted as best practice in roading but has some areas where development would be advantageous.

RAMM Works Manager

The RAMM module (previously Contractor) is utilised by both Contractor and Council to manage the maintenance task on a common platform. Dispatches are uploaded from the RFS systems, with some being directly managed and received by the contractor. These are then assigned by priority to programmes, submitted for approach, work start and other process attached, completed and signed off, and payment requested and approved within the module. Maintenance costs are linked to assets and transferred to RAMM inventory for use in other modules.

Treatment Selection Algorithm

RAMM has a treatment selection function which analyses the absolute values of defects and distress data in a costing algorithm which takes into account the faults measured, carriageway roughness, traffic volumes and maintenance cost to determine overall costs of alternative treatments and an optimal programme of works.

RAMM GIS

RAMM software system has a strong GIS platform to visualise, question, analyse, interpret and understand RAMM data.

JunoViewer

JunoViewer is a customizable framework application for asset management and is used for advanced asset pavement and resurfacing deterioration modelling, and seamlessly combines data management and asset analysis into one centralized application.

A typical JunoViewer analysis consists of two steps – Generating Strategies and Optimization. Generating Strategies constructs a list of strategies for each road element and Optimization chooses one strategy from the list for each element so that an objective function is achieved while not violating established constraints.

This analysis generates a list of feasible strategies and programmes for each infrastructure element in the database and predicts the future conditions of the elements.

Crash Analysis System (CAS)

CAS is a Waka Kotahi system for recording crashes. The data is collected and stored for use in research and decision making aimed at improving road safety, and as such benefits all New Zealand road users. Council staff have an obligation to protect any confidential data and people's privacy.

My Worksites - Corridor Management System

As the Road Controlling Authority for the Invercargill's Local Road Network. Council uses My Worksites is an online system for managing Corridor Access Requests (CARs) and Traffic Management Plans (TMPs) applications.

Deficiency Database

Council has a deficiency 'database' which is utilised to prioritise safety works in the Low Cost Low Risk budget area (previously known as minor improvement budgets). Council will, during the Plan, participate in revisiting the Safety Management System (SMS) across the region. Waka Kotahi has also been developing software for its Safer Networks Programme (pipeline tools) on a GIS platform and it is expected that this will be a shared medium.

A key component of this process is the identification and recording of hazards and safety deficiencies in the network.

Hazards (e.g. possible flooding in severe storms) can only be managed when they occur and need to be distinguished from deficiencies (which can be improved or eliminated).

Once deficiencies have been identified, they can either be rectified as part of a maintenance contract or considered for improvement through a prioritisation process based on their safety risk.

Geographical Information Systems (GIS)

Council has a corporate software suite to graphically determine and understand where Council facilities or assets are located. This includes geocoding our data, putting it on a map, and symbolizing it in ways that can help visualize and understand the data.

Infor Pathway

Infor delivers a comprehensive software platform offering of integrated functionality for managing council related business processes including:

- **Customer Service and People Management** – central name / address register and customer request management.
- **Land and Property Management** – administration tools to assist with land and property management.
- **Revenue Management** – capabilities such as rates accounting, property valuations, debtors and water billing.

Infor Public Sector (IPS)

IPS (Hansen) is used by Council to manage its piped network and building assets but not used by Roading.

TechOne

Council has recently implemented a new financial suite and its capabilities will assist with financial management, budget and reporting.

Objective (called BURT)

Delivers an Electronic Document and Records Management (EDRMS) service across all of Council providing information management processes and business process automation with robust security, version control and audit management to ensure Council complies with recordkeeping standards; this reduces the risk associated with managing information in multiple locations

9.5 PROGRAMME PERFORMANCE MONITORING AND REVIEW

9.5.1 Monitoring Approach

Council has shifted its governance reporting focus to a quarterly basis which includes forecasting expenditure for an 18 month window.

The financial performance, key performance indicators and levels of service are monitored and measured against those from the Long-Term Plan, as well as any measures that are provided from the relevant ministry which monitors the activity, such as the Department of Internal Affairs.

As noted in Section 8, Roading utilises a monthly accrual and reporting process to have a much tighter financial control over expenditure and be able to see what costs are at an early stage. This allows for informed decisions to be made to ensure programmes are delivered to budget and the right decisions have information available to support them.

Two approaches to reports have historically been used, however the new system is more closely aligned to Waka Kotahi work categories. This will assist with the Waka Kotahi claiming process as well as ensure only the correct expenditure is allocated to subsidised works.

Procedural audits are undertaken by Waka Kotahi and have had favourable reviews, Council is latest review2023 is still in draft form (appendix 21). Council is developing further internal audit process for corporate risk management

Quarterly forecasting is required by Council and Waka Kotahi (Performance Monitor).

All Council systems are focused on costs issues, and some care is required for budgeting and claiming to ensure that the correct amounts are recovered and that where appropriate the maximum claims are made from Waka Kotahi.

Reports from ONRC are included within the Appendix 16 and Appendix 17.

9.5.2 Frequency of Review

The performance measures are published yearly in the Annual Report with commentary from Managers as to the level of service against the estimated measure.

10. Continuous Improvement

This section describes all the improvement items that Invercargill City Council aims to implement.

10.1 CURRENT ACTIVITY MANAGEMENT PRACTICE

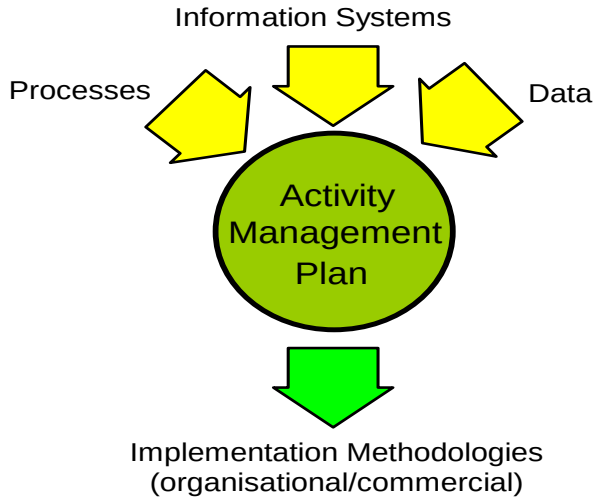
The Roading Asset Management Plan is a living document, which is integral to short and long-term asset management activities. Council has adopted a continuous improvement procedure to ensure that this Asset Management Plan remains useful and relevant.

Improving the management of Council's roading assets is part of a continuous improvement strategy. This strategy acknowledges that there are always opportunities for the improvement and refinement of Asset Management practices.

The key Asset Management inputs required to support good Asset Management planning include Processes, Information systems and Data.

The traditional relationship between the asset / activity management plan, its supporting practices (processes, data and information systems) and implementation tactics (commercial tactics and organisational / people issues) is illustrated as follows:

Figure 10.1 Key Asset Management Inputs



The following table looks to identify and expand what best practice looks like and help identify where future efforts should be directed.

Best Practice continues to evolve and Te Ringa Maimoa is part of the sector led focus.

Council will continue to invest in understanding contributing knowledge to local groups, and using and expanding the understanding and skills of its staff.

Table 10.1 Asset Management Practices

AM Element	Asset Management Practices
Systems / Data Management	• Better information on asset attributes, condition and performance data for pavements, footpaths and bridges • Improve data on ONF and ONRC levels of service and look to understand those relationships • Update RAMM for renewal and new works

	• Upload missing data and validate data by field validation and local knowledge • Maintain maintenance data linked to assets through pocket RAMM technology • Perform regular auditing of data uploaded by maintenance contractors • Data collection for missing data through field inspections • Use technology for better knowledge • Understand DeFT changes in data management ready for the future including ADMS
Valuation, Depreciation and Effective lives	• Manage valuation process to comply with Financial Reporting International Accounting Standard (PBE IPSAS 17) New Zealand equivalent to "Accounting for Property, Plant and Equipment" and align with Council's direction in the Financial Strategy • Use of the RAMM Asset Valuation Module • Have valuation rates which are appropriate and reflect the cost, confirming alignment with contract rates • Plan for ongoing valuation knowledge and understanding
Asset Costing	• Investigate and understand with confidence lifecycle costs and ensure they are based on lifecycle analysis from RAMM inventory data (e.g. condition rating data, roughness data)
Asset Renewal and New Works Strategy	• Have FWP for 5 to 10 years for modelling and delivery prepared from Treatment Selection Algorithm of RAMM with field validation and reporting
Service Level Specification and Measurement & ONRC/ONF Customer Outcomes and Technical Outputs	• Focus on ONRC LoS and merge with BAU for Council • Be responsive and focused have Customer surveys with complaints used to understand customer needs • Use current technology and CCDC programme to assess performance of some assets » NAASRA survey for roughness » SCRIM survey for skid resistance » High speed data survey for roughness, skid resistance, texture, geometry, rutting, etc. • Use field surveys for ONRC/ONF Performance Measures • Use Contractors or Consultants for » Road condition rating » Footpath condition rating » Bridge condition rating • Report Department of Internal Affairs performance measures
Review, Audit and Continuous Improvement	• Annual financial audits • Implement improvement plans identified in current Asset Management Plan • Peer review of Asset Management Plan
Maintenance Renewals New works	• Competitively tendered service delivery contracts in place for major contract items. Aligned to Procurement Strategy and Smart Buyer Principles. • Good project and contract management procedures in place
Risk and Assurance Plans	• Have a development approach for identifying and managing risks which supports a deficiency database • Communicate risk to governance and the community • Develop assurance testing plans to give greater certainty for activities • Lifelines Project to identify high level risk areas in the event of natural disaster • Develop long term focus on resilience and climate change, understand impacts and link to forward programmes

10.2 IMPROVEMENTS FROM 2021 ACTIVITY MANAGEMENT PLAN

10.2.2 2017 AMP Improvement Plan Status

A summary of the improvements in the previous AMP is provided below, including commentary on their status. Those where ongoing or further effort is needed are carried forward into the 2023 Improvement Plan, with the relevant project number highlighted.

Table 10.2 2017-2020-2023 AMP Improvement Actions from Peer Review

Section	2017 AMP Suggested improvements	Improvements made in 2020 AMP	Improvements 2023 AMP
Executive Summary	• ES could be expanded to provide a more representative coverage of the AMP, sub-headings also useful	• ES expanded and updated	•
Introduction / Strategic Context	• Make explicit in the diagrams that the strategy is for 30 years	• S2.4.4 title is 30 Year Infrastructure Strategy - ok	• Complete
Levels of Service	• Refer explicitly to the table in S3.4.2 as relating to "years 1 to 3 in detail, in outline for the remainder of the 10 year period". • Align past performance with current and intended LoS provision / targets to specifically show the intended changes. • Confirm how LoS will be more widely communicated to the public (wider than LTP measures – consider ONRC).	• New table in S3.4.2 – this comment could still be included • Comparison included • General comment made in S3.4.1 including ONRC vs local expectations	•
Demand	• Add sensitivity discussion if appropriate (e.g. would there be a programme if demand increased significantly?)	• Discussion not added – although as growth is flat this may not be relevant	• There has not been much or projected to be growth. Not foreseen that demand would be increased.

Risk	• Provide an update on the lifelines risks and proposed management actions.	• Still to do – action through the Improvement Plan	• Still to do
Asset Description	• Include summary of useful and remaining lives in Section 5 for each asset • Provide more complete picture of condition across the portfolio. • Quantification of capacity (e.g. network capacity available at peak hours / HCM typical operating levels, bridge postings / restrictions, etc.) • Suggest include a sub-heading entitled Performance Monitoring and summarise actions in a table (as done for Condition).	• Asset lives now included • There is little actual condition data that can be reported in summary, other than pavements. Comments made in AMP. • Capacity issues yet to be actioned. • (Asset) Performance Monitoring section not yet added.	•
Life-cycle Management	• Create a table to show how the LoS in S3 are linked to the various work categories in S7. • Projected costs for new assets, including those from subdivision developments, should be included in the AMP's analyses.	• Table linking strategic responses to work categories is provided in S7.2.9. The former are linked to LoS in S2.8	• Complete
Financial Forecasts	• Make explicit comment in the AMP as to the materiality of changes to the costs of service (even if there are none) – suggest this be where alternative options are discussed in Section 7 and programmes summarised in Section 8.	• Materiality of changes yet to be addressed – suggest make comments in S8 when programmes are finalised • New vs renewal capital – yet to be done in S8 • Summary programmes presented in S7.18 by work category. S8.2	• TBC

	• Clarify the split between new and replacement capital for the projects / work categories so affected. • Improve the line of sight from the individual programmes by work category to the summary tables in S8.2 • Provide in the AMP or Appendices long term projections of renewal needs by asset type, suggest based on the asset valuation. • Include the depreciation forecast in the AMP, showing how it has been developed and how it is linked to changes in the asset base (new assets in particular) • Discuss the implications and meaning of the depreciation vs renewals graphs. • Discuss / assess the potential effects of the uncertainties identified on the financial forecasts (e.g. sensitivity analysis)	provides a differently structured reporting of programmes. • Appendices yet to be finalised and sighted for review. • Depreciation forecast (and essential services benchmarking information) yet to be included in S8. • Although reliability is covered in S8 should also include sensitivity discussion – "what happens if" question	
Improvement Plan	• Document KPI's to monitor and report on improvement plan progress. • Create a table of actions at the end of each section, cross-referencing to the relevant	• The new REG template provides for improved tracking of each action and by whom	•

	section, then aggregating them all in S10.		
Other	• Assumptions. While the data is in the AMP, Section 5.2 could be strengthened by including the consideration of useful lives and underlying assumptions. • Sustainability. Quantify the issues where possible, could be an improvement plan action. • AMP Structure and Content. Continue to refine and link content.	• S5.2 has been updated with discussion of lives where appropriate • Sustainability yet to be further developed. • 2020 AMP has made improvements over 2017 version	•

Table 10.3 2020 AMP Improvement Actions, 2023 Status Update

AM Element	Summary	Current Status	Link to Project No.
RAMM Data	RAMM Data Quality Plan	The improve data quality regarding Te Ringa Maimoa Insights Tool reporting score is evident.	16
	Culvert renewal plan	To be progressed	47
	Formal RAMM audit procedures for contractor data	Draft Contract Asset Data Management Plan developed	28
Maintenance	Identify network risks due to bridges	Work needs to be completed in association with Lifelines project update	52
Activity Plan	Smoother roads communication plan	Changed to a full community and engagement strategy and plan to be developed.	32
	Network Operating Framework	NOF to be progressed in 2023	51
	Develop surveys around performance outcomes (e.g. HCVs, cyclists, etc)	To be progressed	33
	Better link technical LoS to customer LoS and community outcomes	Clear linkage is shown between the GPS, One Network Road Classification (ONRC), RLTP, community and ICC objectives.	4
Service levels	Renewals funding model to test ability to pay	ICC's focus on customer satisfaction and achieving value for money can be observed throughout the AMP. Funding models for surfacing tested though dTIMs and JunoViewer modelling	5
Asset information	Review impacts of funding on footpath condition	To be carried out using 2023 footpath data once condition assessment data available	6
Financial	Create improved linkage between renewal, deferrals and maintenance	Forward works programme model identifies rehabilitation locations and then linkages to determine the linkage between renewal, deferral and maintenance approaches are tested through NPV models	7
	Road Safety Action Plan and Safety Programme	Council have implemented their Interim Speed Management Plan. We have been working closely alongside and leveraging Waka Kotahi Road to Zero team and have developed the Low Cost Low Risk	64-66

		Improvement Plans and NLTP 24-27 bid alongside them.	

Table 10.4 2020 AMP Improvement Actions from 2023 Status Update

Area	Summary	Current Status	Link to Project No.
Network Performance	Update 2011 traffic model to assess intersections level of service.	A draft Network Operating Framework, was being undertaken in conjunction with Waka Kotahi NZ Transport Agency, to establish a clear functional approach for the network, including active transport and public transport modes, and make explaining the ONRC functions of roads clearer to stakeholders.	19
Risk Based Optimisation	Improve condition data and use to determine financial risk exposure based on asset criticality.	To be progressed	20
Procurement	Consider Alliance contract form for next Road Maintenance Contract addressing network delivery with actual cost reimbursement targeting an improved level of service.	Contract 1167 a collaboration, shared risk cost reimbursable contract was established and started on 1 October 2023	60
	Review potential merging of contracts such as sealed and unsealed maintenance to reduce administrative duplication.	Sealed, unseal and street light maintenance have been included in the Waihopai Road Alliance Contract	61
Network and Asset Management	Review possible shared services with neighbouring authorities, including professional services.	Mayoral Forum, CEOs and GMs currently discussing potential areas within Council which could benefit from neighbouring authorities working together for possible shared service	74
	Ensure time and cost management is aligned with correct cost centres.	Complete – Ongoing	65
Bridges	Improve reporting of general condition.	Ongoing inspections and condition assessments undertaken	
Sealed Roads	Consider enhanced data collection and modelling framework including annual RAMM Condition rating of an annual All Defects survey. JunoViewer could also be a useful tool to display condition trends and video records of road conditions.	Further work is required to monitor pavement strength capacity for heavy vehicles (50 Max and HPMV) as more access is utilised across the network. JunoViewer is a useful tool to display condition	21

	Review skid resistance issues in relation to intersection-related crashes, urban / rural mix and speed for rural, wet weather crashes and crashes where the road is a contributing factor.	JunoViewer is a useful tool to display condition and bi-annual forward works programme assessments and reports	22
	Consider increased use of polymer modified binder in high stress situations to reduce the need to use high cost asphalt on sites where that is an option.	Draft Road Surfacing Strategy is being developed	45
Kerb and Channel	Improve construction dates and condition data to provide better confidence for renewal.	To be progressed	23
	Investigate rejuvenation trials on aged concrete kerbs and channels for restoring serviceability.	To be progressed	46
Drainage	Develop a strategic approach to drainage incorporating data review, treatment length approach, ONRC-linked risk and consequence approach.	To be progressed	47
	Improve condition and performance data, more inspections and condition monitoring to help determine risk areas and develop predictive modelling capability.	To be progressed	24
Traffic Services	Implement condition monitoring and reporting of the asset.	To be progressed	25
Footpaths and Cycleways	Develop a strategic approach to managing footpaths, incorporating data review, treatment length approach, trip-generation factors, ONRC-linked risk and consequence approach.	There is issues associated with cycle lane continuity and rural cycling circuits	48
	Develop hierarchies for footpaths and cycleways to form the basis for investment over time (NOF approach), and to determine minimum standards adjacent to schools and shopping areas.	This will be developed through the AMDS Network Planner work which Invercargill is programmed to be develop in June 2024	49
	Complete inventory stock-take and conduct systematic, consistent condition evaluation to inform renewal planning	To be Progressed	26

	Ongoing monitoring of demand in order to determine whether there is a need to improve LoS.	To be progressed	27
Environmental Management	Review urban and rural spraying methodology to provide a better all-round level of service. Mechanical treatment of shoulders could also be trialled.	Plan to increase number for sprays	50
	Develop a Vegetation Control Strategy to manage the delivery of vegetation control in the maintenance contract.	To be progressed	63
Public Transport Assets	Improve asset and lifecycle cost data to inform renewal needs.	Undertaken with bus timetable changes	
Road Safety	Implement network management controls to reduce operating speed in at-risk areas.	Council have implemented their Interim Speed Management Plan. We have been working closely alongside and leveraging Waka Kotahi Road to Zero team and have developed the Low Cost Low Risk Improvement Plans and NLTP 24-27 bid alongside them.	64
	Develop and implement a Safety Strategy where community behavioural change occurs which leads to safer outcomes for vulnerable road users.		65
	Develop a strategy for road risk management, including speed, through localised traffic design.		66
Demand Management Behaviour Programmes	The need for a travel demand management programme is to be investigated.	Requests for Heavy Vehicle travel from the transport industry have been mostly achieved but timeliness for approval could be improved. Improve Traffic Count and Modelling to enable Travel Demand Management Planning	51
Improving Plans	Various actions: ➢ Community consultation related to the improvement of AMPs and RPTPs and speed management plans ➢ Associated demand forecasting and demand management planning ➢ Development of levels of service targets and implementation plans	Ongoing with Te Ringa Maimoa workshop attendance	31

	➢ Asset performance and service gap analysis ➢ Optimisation process development, including development of network operating plans ➢ Financial forecasts ➢ Development and improvement of asset deterioration models		

Ongoing updates have been undertaken to improve data quality as shown in the PMRT reporting score. This has highlighted in several areas where small improvements can still be made to data and better align data quality with national expectations.

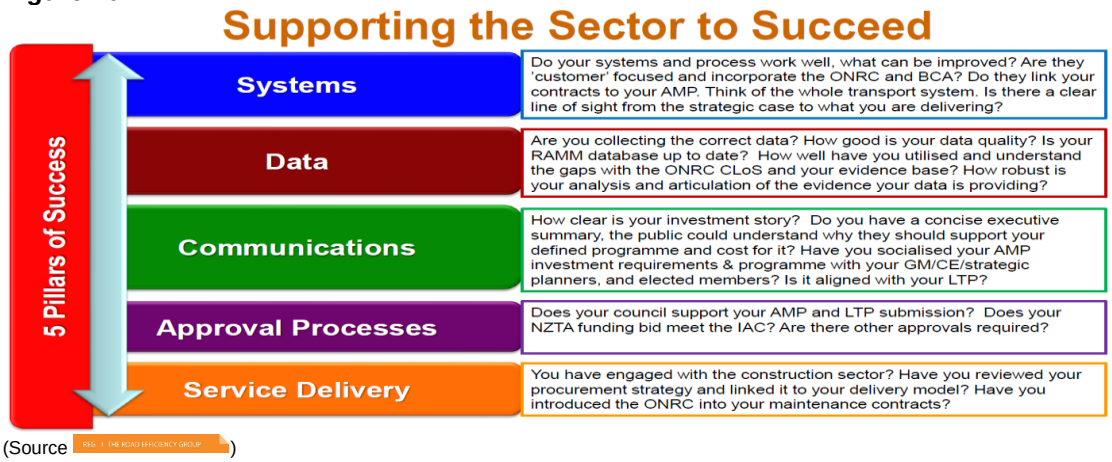
The “better business case” approach continues to contribute to a more mature approach to asset planning and more in-depth consideration of the level of investment considered and the options which are available. This has contributed to the future direction in the resurfacing area where if not for this view, the assets could have been headed for a decline and require more investment and failure of pavements rather than investment in surfacing and waterproofing. These extra asset options contribute to a stronger plan.

Better communication has occurred with elected representatives on understanding depreciation and Financial Assistance Rate changes.

10.2.3 Te Ringa Maimoa Alignment

In developing this Plan, Council has also engaged in the Te Ringa Maimoa training workshops and been developing new improvements that align to the Te Ringa Maimoa pillars shown below.

Figure 10.2



(Source)

In aligning with Te Ringa Maimoa initiatives, the Strategic Case within this Plan has been strengthened and aligned to GPS 2021.

The improvement plan in the following section utilises the Te Ringa Maimoa spreadsheet-based template tool. This will be used to track and report on progress.

The Te Ringa Maimoa tool groups improvement initiatives in six areas, which can be linked to the traditional categories in Figure 10.2.:

- Systems – i.e. AM processes and Information Systems
- Evidence – i.e. AM data and analysis results
- Communication – i.e. the AMP
- Decision Making – i.e. AM processes
- Service Delivery – i.e. Commercial
- People / Culture – i.e. People

10.3 IMPROVEMENT PROGRAMME

10.3.1 Improvement Actions identified in Current AMP

The following items summarised below have been identified in preparing this AMP. These and those remaining for completion from Table 10.2 above have been incorporated in the Improvement Programme in Section 10.3.2.

Table 10.5 New Improvement Actions

Area	Improvement Action	Link to REG Tool	Link to Project No.
Root Cause Analysis	Adopt a five-whys approach	System	8
Benefits Framework	Apply Waka Kotahi benefits framework	System	9
Differential Levels Of Service	Further work needed for the Technical Levels of Service and optimisation through development of differential levels of service.	System	3
Community Engagement Strategy and Plan	Work with Road Safety Southland, Te Ringa Maimoa and Waka Kotahi and partners to understand the gaps in telling the investment and benefit 'story' to our community.	Communications	32
Car Parking Network	Investigate travel demand management and user group requirements for car parking provision in the City	Decision Making	53
Awarua Quarry Pit	Engage quarry specialist to understand the future use potential of the quarry and develop a quarry management plan.	Decision Making	54
Integrated Transport Strategy	Strategically focus effort in the things that make the best progress across multiple outcomes (Whole system approach, collaborate with partners, Evidence-based, Tailor Solutions)	Decision Making	55
Ōtātara Community Safety Developments	Council would like to investigate the potential to improve safety and place for the Ōtātara Community, this could include development of footpaths, streetlights and ditch improvements. Staff will investigate these for inclusion in the 2027 Roading Asset Management Plan.	Service Delivery	67
Collaborative Relationship Plan	Develop a communication and collaborative relationship plan with key	Communications & People and Culture	34

	stakeholders in the Transport Activity and Roading Asset Network		
Asset Management System	Undertake a review of the Asset Management Maturity	System	
Network and Asset Management	Review of RAMM data to be undertaken more frequently	System	
	Undertake and implement traffic count strategy	System	
	Implement Asset management Data Standards Project	System	

10.3.2 Improvement Plan Programme

The following programme has been prepared to assist with planning, implementing and monitoring improvements to this Plan:

Table 10.4 Improvement Programme[41]

- *The following table has been built from the 2017 Road Efficiency Group Report and then developed further from the 2021-24 Amp Review by Te Ringa Maimoa (Appendix 17) Improvement Opportunities as described below.*

[41] Table below needs to be updated to include improvements above without numbers

Proje	Pillar	Title	Activity	Previous Status	Current Status	Future Status and Improvements	Improvement Approach	Priority	Responsibility	% Com	% Com	% Com	Risk Le
1	System	Improvement Framework	Adopting regional improvement framework	New framework prototype drafted for discussion and feedback		Agreed framework adopted and signed off by Waka Kotahi and RCAs. Regular meetings and monitoring. Supports continuous improvement and NLTP funding conditions. Preparing RCA	Partnership workshop to discuss approach and framework	High	Asset Manager - Transport	10	75	80	High
2	System	Line of Sight	Improve the use of the BCA and line of sight connection in AMP and programme of works	Regional AMP has been developed with regional problem statements. There is a sound use of asset management principles. BCA, ONRC and other strategic documents as well as MCA.	There is scope for structuring the AMP in a better way so that it communicates infrastructure requirements more clearly through the use of the Business Case Approach (BCA).	The use of the International Infrastructure Management Manual (IIMM) AMP structure should be investigated to further improve the AMP.	Investigate document structure potential improvements. BCA and IIMM AMP structure could be better utilised with clear root cause analysis.	High	Asset Manager - Transport	25	55	60	Medium
3	System	ONRC/ONF Integration	Improve how the ONRC is linked to business systems	Regional AMP has been developed incorporating the ONRC; 2018 NLTP use of the ONRC was a new initiative and work to date has started the integration. The ONF is a new initiative for Waka Kotahi and Te Ringa Maimoa 2021-22, ICC AMP has used these measure where appropriate, the ONRC is still more appropriate when discussing surfacing	The Council has a good understanding of One Network Road Classification (ONRC) principles. ONRC measures and outputs from Te Ringa Maimoa Insights Tool are utilised in the AMP. Council is currently working towards nationally consistent (and differential) customer levels of service,	Business / AMP systems fault integrated with ONRC and ONF classification, level of service, and use of performance measures	ONRC performance measures should be linked to problems, benefits and objectives more comprehensively. ONRC measures could demonstrate a better linkage to gap analysis and be used as evidence to support the problem statements. ONRC measures could be better linked to benefit realisation.	High	Asset Manager - Transport	10	15	25	Low
4	System	Technical (and Differential) levels of Service	Better link technical LoS to customer LoS and Community Outcomes	CLoS linked to outcomes in 2020 AMP; further work needed for TLoS following completion of One Network Framework - alignment needed	Clear linkage is shown between the GPS, One Network Road Classification (ONRC), RLTP, community and ICC objectives.	Further work needed for TLoS to include differential LoS following the One Network Framework - alignment needed	Work with Te Ringa Maimoa and Peers to understand and develop DLoS	Medium	Asset Manager - Transport	0	0	80	Medium
5	System	Financial - Ability to Pay	Renewals funding model to test ability to pay	Not yet begun	ICC's focus on customer satisfaction and achieving value for money can be observed throughout the AMP. Funding models for surfacing tested though dTIMs and JunoViewer modelling	Undertake further funding models on other asset types. i.e. Footpath and drainage	Partnership workshop to discuss approach and framework	Medium	Asset Manager - Transport	0	0	50	Medium
6	System	Financial - Footpaths	Review impacts of funding on footpath condition	Not yet begun	Footpath condition assessment underway in 2023, this data will be used as the foundation of funding impacts to asset class	Funding model for footpaths		Low	Asset Manager - Transport	0	0	10	Low
7	System	Lifecycle decisions	Create improved linkage between renewal, deferrals and maintenance	Not yet begun	Forward works programme model identifies rehabilitation locations and then linkages to determine the linkage between renewal, deferral and maintenance approaches are tested through NPV models	Integrated modelling system for the development of Optimised Decision Making	Work collaboratively with other RCAs, Te Ringa Maimoa and Waka Kotahi	Medium	Asset Manager - Transport	0	0	70	Low
8	System	Root Cause Analysis	Adopt a five-whys approach		Not yet begun			Medium	Asset Manager - Transport			0	Medium
9	System	Benefit Framework	Apply Waka Kotahi benefits framework to show the investment benefits more clearly		Not yet begun			High	Asset Manager - Transport			0	High
16	Evidence	RAMM Database	Upgrade of the RAMM databases	2016/17 Data Quality score 34. Number of major data quality issues present	The Council's intention to improve data quality regarding Te Ringa Maimoa Insights Tool reporting score is evident.	Accurate, complete and timely RAMM data to better inform investment decisions and facilitate performance management. Improved capability to utilise data. RAMM Data Quality Plan	Audit RAMM databases and identify gaps. Develop and implement prioritised action plan. Assess options for future management of RAMM databases.	High	Asset Manager - Transport	20	45	50	High
17	Evidence	ONRC / ONF measures	Collection and reporting of ONRC and ONF customer performance and technical output measures	A number of ONRC performance measures are not being collected and/or monitored	Te Ringa Maimoa Insights Tool is used for performance comparison/ benchmarking with other RCAs (either at a Regional or National level). This serves as a good foundation to set targets for key performance indicators. There is a good peer comparison using Waka Kotahi work categories as the foundation.	Collect data to better understand network performance indictors, comparative measures and guide investment	ONRC and ONF data collection plan, collect and store data, analyse and report	High	Asset Manager - Transport	25	40	60	Medium
18	Evidence	Satisfaction surveys	Collection and analysis of customer and stakeholder satisfaction with the road networks	Varied approach to customer satisfaction surveys	Council undertakes quaterly satisfaction surveys, these do not include roading.	Review satisfaction survey questions and usefulness of data received. Adopt consistent approach across Southern Region to enrich data set and contribute to benchmarking.	Define customer users groups, develop plan and programme for collection of data from user groups, implement and analyse data. Key performance indicator for the Waihopai Alliance to be included in the contract performance framework.	Medium	Asset Manager - Transport	30	30	40	Low
19	Evidence	Network Performance	Update 2011 traffic model to assess intersections level of service	Not yet begun	A draft Network Operating Framework, was being undertaken in conjunction with Waka Kotahi NZ Transport Agency, to establish a clear functional approach for the network, including active transport and public transport modes, and make explaining the ONRC functions of roads clearer to stakeholders.	It would also assist with defining priority and providing input to establishing bypass roads and how the traffic, in particular the freight element, can effectively access and pass through Invercargill to the Bluff Port and other commercial areas. This will provide a better 10 year network focus for future plans	Ensure traffic count data and travel demand management behaviour models are understood. Requests for travel from the transport industry have been mostly achieved but timeliness for approval could be improved.	High	Safety and Network Manager	0	0	0	Medium
20	Evidence	Risk Based Optimisation	Improve condition data and use to determine financial risk exposure based on asset criticality	Some condition data available	Unchanged			High	Asset Manager - Transport	0	10	0	Medium

.

20	Evidence	Risk based Optimisation	criticality	Some condition data available	Unchanged			High	Asset Manager - Transport	0	10	0	Medium
21	Evidence	Sealed roads pavement condition	Consider enhanced data collection and modelling framework including annual RAMM Condition rating of an annual All Defects survey	Not yet begun	Further work is required to monitor pavement strength capacity for heavy vehicles (50 Max and HPMV) as more access is utilised across the network. JunoViewer is a useful tool to display condition	JunoViewer could also be a useful tool to display condition trends and video records of road condition	All defects and CCDC will improve outcomes in this space	High	Asset Manager - Transport	0	0		Medium
22	Evidence	Sealed roads surface condition	Review skid resistance issues in relation to intersection-related crashes, urban/rural mix and speed for rural, wet weather crashes and crashes where the road is a contributing factor	Not yet begun	JunoViewer is a useful tool to display condition and bi-annual forward works programme assessments and reports	JunoViewer could also be a useful tool to display condition trends and video records of road condition	All defects and CCDC will improve outcomes in this space	High	Safety and Network Manager	0	0		High
23	Evidence	Kerb and channel dates	Improve construction dates and condition data to provide better confidence for renewal	Ongoing activity	Unchanged			Medium	Asset Manager - Transport	40	50		Low
24	Evidence	Drainage asset condition	Improve condition and performance data. More inspections and condition monitoring to help determine risk areas and develop predictive modelling	Not yet begun	Unchanged		Condition Assessment schedules should be programmed into RAMM	Medium	Asset Manager - Transport	0	0		High
25	Evidence	Traffic services condition	Implement condition monitoring and reporting of the asset	Not yet begun	Unchanged		Condition Assessment schedules should be programmed into RAMM	Medium	Asset Manager - Transport	0	0		Medium
26	Evidence	Footpath and cycleway data	Complete inventory stock-take and conduct systematic, consistent condition evaluation to inform renewal planning	Not yet begun	Unchanged			Low	Asset Manager - Transport	0	0		Low
27	Evidence	Footpath and cycleway demand	Ongoing monitoring of demand in order to determine whether there is a need to improve LoS	Not yet begun	Unchanged			Low	Asset Manager - Transport	0	0		Low
28	Evidence	Maintenance data	Formal RAMM audit procedures for contract data. RAMM maintenance data process improvements	Not yet begun	Draft Contract Asset Data Management Plan developed	Finalise plan	Work with Fulton Hogans Engineering Service Team to refine and develop Contract Asset Data Management Plan for review, refinement and agreed approvals	High	Asset Manager - Transport	0	0	60	High
30	Communication	Asset Management Plan	Fully integrate the technical asset management plan with BCA AMP to support a cohesive investment story	Two separate documents exist; Combine BCA Activity MP and technical Asset MP	Unchanged	Explore potential to integrate and combine for a more cohesive investment story	Review audit NZ findings and REG guidance. Discuss approach with NZTA IA	Medium	Asset Manager - Transport	35	60		Medium
31	Communication	Improving Plans	Range of improvements can be made to AMPs, aligned with the outcomes of the improvement		Although the AMP includes financial forecasts (10 years and 30 Years), financial forecasting and other funding information, the investment benefits and the overall investment narrative are not clear.	The Financial Management section needs some improvement and needs to be updated. Document linkage could be improved by referencing appropriate sections in the AMP. The layout of the AMP does not clearly integrate the BCA structure.	Ongoing with Te Ringa Maimoa workshop attendance	Medium	Asset Manager - Transport	35	60		Medium
32	Communication	Community Engagement Strategy and Plan	Safety is a singificant concern on the Invercargill roading network, especially in terms of intersections and vulnerable road users. The community needs to understand the "Story" of why investment into the safety and the network in general is so important.	Smoother roads communication plan	Not yet begun	The community is invested in making our roads safer.	Work with Road Safety Southland, Te Ringa Maimoa and Waka Kotahi and partners to understand the gaps in telling the investment and benefit 'story' to our community.	High	Asset Manager - Transport	0	0	0	Medium
33	Communication	Customer surveys	Develop surveys around performance outcomes (e.g. HCVs, cyclists, etc.)	Not yet begun	Unchanged			Medium	Safety and Network Manager	0	0		Medium
34	Communication	Collaborative Relationship Plan	Develop a communication and collaborative relationship plan with key stakeholders in the Transport Activity and Roading Asset Network		Not yet begun	Strong informed collaorative relationships with key stakeholders		High				0	Medium
44	Decision Making	Forward works programme	Programme Development	Lack of data and evidence base to develop proactive forward works programmes	Using data and developed a 30 year-longer term view in for renewal programme used dTIMs in 2020 and JunoViewer in 2023 (10-year Programme)	Te Ringa Maimoa and Waka Kotahi have developed a co-ordinated approach to data collection (CCDC) this reviewed the strategic problems and priorities, develop and assess a fully funded programme for 2024-2027 NLTF bid.	Need to consider the potential to develop add-on programmes (SCRIM) and other similar condition assessment tools for footpath and drainage programmes.	Medium	Asset Manager - Transport	40	60	90	High
45	Decision Making	Sealed roads surfaces - polymer seals	Consider increased use of polymer modified binder in high stress situations to reduce the need to use high cost asphalt on sites where that is an option		Draft Road Surfacing Strategy is being developed	Inplement Road Surfacing Strategy		Medium	Asset Manager - Transport	0	0	70	Medium
46	Decision Making	Kerb and channel rejuvenation	Investigate rejuvenation trials on aged concrete kerbs and channels for restoring serviceability		Unchanged			Medium	Asset Manager - Transport	0	0		Low
47	Decision Making	Drainage; strategic approach	Develop a strategic approach to drainage incorporating data review, treatment length approach, ONRC - linked risk and consequence	Initiated	Unchanged			High	Asset Manager - Transport	0	0		Medium

48	Decision Making	Footpath and Cycleways - strategic approach	Develop a strategic approach to footpath and cycle lanes incorporating data review, treatment length approach, trip-generation factors, ONF - linked risk and consequence		There is issues associated with cycle lane continuity and rural cycling circuits			High	Asset Manager - Transport	0	0		Low
49	Decision Making	Footpath and cycleways Hierarchy's	Develop hierarchies for footpath and cycleways to form the basis for investment over time (NOP approach) and or determine minimum standards adjacent to schools and shopping areas		This will be developed through the AMDS Network Planner work which Invercargill is programmed to be develop in June 2024	Full AMDS Network Planner will be in place	Work with Waka Kotahi to refine inplementation	High	Asset Manager - Transport	0	0	30	Low
50	Decision Making	Environmental Management - Weed spraying	Review urban and rural spraying methodology to provide a better all-round level of service		Plan to increase number for sprays	Monitor and adjust as required		Medium	Alliance Manager	0	0	80	Medium
51	Decision Making	Demand Management Behaviour Programmes	The need for a Travel Demand Management Programme is to be investigated		Requests for Heavy Vehicle travel from the transport industry have been mostly achieved but timeliness for approval could be improved.		Improve Traffic Count and Modelling to enable Travel Demand Management Planning	Low	Safety and Network Manager	0	0	10	Medium
52	Decision Making	Lifelines resilience	Identify network risks due to bridges		Risk and resilience have been considered at a competent level. From a resilience to natural hazards perspective, events and their general consequences have been considered.		Work needs to be completed in association with Lifelines project update	Medium	Strategic Asset Planning Manager	0	0	10	Medium
53	Decision Making	Car Parking Network	Parking is available free close to the City Centre and may need further investigation to better manage the opportunities available to encourage Public Passenger Transport usage.		The need for allocating parks to all the sector groups (including the disability groups) will create additional pressure on parking.	The new ICL development is likely to impact and change car parking patterns and future consideration is needed to demand as the city centre changes.	Investigate travel demand management and user group requirements for car parking provision in the City	Medium	Asset Manager - Transport	0	0	0	Medium
54	Decision Making	Quarry pit and unsealed road metalling material	Councils quarry pit at Awarua has no remaining life without expansion (requiring resource consent approvals)		This resource is currently unavailable to the for metal for the renewal of unsealed roads and is currently being procured from the market.	Reinstatement costs at the current pit must be met by royalties from the materials taken, although historically are unlikely to meet the closing costs	Engage quarry specialist to understand the future use potential of the quarry and develop a quarry management plan.	High	Asset Manager - Transport			0	High
55	Decision Making	Transport Strategy	Future Network Planning Provide an integrated system view of theta we want for the future network		Investigating where the greatest challenge and opportunities are for achieving long-term outcomes (Desired future, current state, drivers and outcome gaps) i.e. Heavy Traffic Bypass, remove State Highway from the CBD?	Strategically focus effort in the things that make the best progress across multiple outcomes (Whole system approach, collaborate with partners, Evidence-based, Tailor Solutions)	Direct effort to the right things, at the right scale in the right time and place (Identify that is needed to achieve success, highlight where effort should be focused, guide scale and timing, monitor progress)	Medium	Asset Manager - Transport			5	Medium
58	Service Delivery	Procurement Strategy	Review of procurement strategies	Out of date procurement strategy	Reviewed, updated and endorsed procurement strategy		Identify what is being purchased, extent of competition in the market and internal staff, purchase selection methods, collaboration opportunities	High	Strategic Asset Planning Manager	45	50		High
59	Service Delivery	Maintenance Contract	Procurement of new transport and roading contracts	10yr maintenance contract ends July 2020	Contract 1167 a collaboration, shared risk cost reimbursable contract was established and started on 1 October 2023			High	Infrastructure Operations Manager	50	90	100	High
60	Service Delivery	Procurement - Alliancing	Consider Alliance contract form for next Road Maintenance Contract addressing network delivery with actual cost reimbursement targeting an improved LoS	Road Maintenance Contract 757 was transitioned into a Alliance Style Contract 979.	Contract 1167 is being established, it is a collaborative contract.		Agree and refine key performance indicators to drive contract improvements	High	Infrastructure Operations Manager	0	0	100	High
61	Service Delivery	Procurement - Merge Contracts	Review potential merging of contracts such as sealed and unsealed maintenance to reduce administrative duplication	Separate sealed, unsealed road, street light and traffic signal maintenance contracts	Sealed, unseal and street light maintenance have been included in the Waihopai Road Alliance Contract	Consider including the traffic signal maintenance contract into the Waihopi Road Alliance Contract	Consider through the procurement planning phase	High	Infrastructure Operations Manager	0	0	80	Medium
62	Service Delivery	Network and Asset Management Costs	Ensure time and cost management is aligned with correct cost centres		Ongoing			Medium	Asset Manager - Transport	0	0	100	Low
63	Service Delivery	Environmental Management - Vegetation Strategy	Develop a Vegetation Control Strategy to manage the delivery of vegetation control in the maintenance contract		Unchanged	Needs to consider treatment requirements for stormwater discharge and detritus as it is becoming more expensive an difficult to manage.		Medium	Alliance Manager	0	0	10	Medium
64	Service Delivery	Road Safety - Network Management	implement network management controls to reduce operating speed in at-risk areas	Needs to be an overall integrated approach for all three items	Council have implemented their Interim Speed Management Plan. We have been working closely alongside and leveraging Waka Kotahi Road to Zero team and have developed the Low Cost Low Risk Improvement Plans and NLTP 24-27 bid alongside them.		Work collaboratively with Road Safety Southland, Police and Waka Kotahi to ensure that a safe system approach to road safe improvements is undertaken. Continue to bid for further speed management, local area traffic management and minor safety improvements. These should be developed alongside the deficiency database.	High	Safety and Network Manager	0	0	70	High
65	Service Delivery	Road Safety - Strategy	Develop and implement a Safety Strategy where community behaviour change occurs which leads to safer outcomes for vulnerable road users	Needs to be an overall integrated approach for all three items				High	Safety and Network Manager	0	0	10	High
66	Service Delivery	Road Safety - Risk Management	Develop a strategy for road risk management, including speed, through localised traffic design	Needs to be an overall integrated approach for all three items				High	Safety and Network Manager	0	0	10	High
67	Service Delivery	Road Safety - Ōtātara Community Developments	Development of footpaths, streetlights and ditch improvements		Council would like to investigate the potential to improve safety and place for the Ōtātara Community		Staff will investigate these for inclusion in the 2027 Roading Asset Management Plan.	High	Asset Manager - Transport			0	High
72	People and Culture	Regional collaboration	Regional collaboration is continued to be developed and new opportunities identified	Collaboration and development of combined AMP occurred in 2018 NLTP		Continue to work together with shared improvement opportunities for AMP development. Identify further collaborative possibilities	Reinstating regular collaboration meetings, Involve both RCAs and Waka Kotahi	High	Asset Manager - Transport	55	75	80	Low

73	People and Culture	Capability plan	Development of regional capability and success plan	No plan in place	Te Ringa Maimoa Insights Tool is used for competency assessment in both Asset Management and Procurement benchmarking with other RCAs (either at a Regional or National level). This serves as a good foundation to set targets for key gaps or improvement areas.	Review individual RCA plans (if available) and identify gaps	Individual RCA capability matrix if core competencies required developed. Combine into an integrated regional plan. Gaps identified collectively. Action plan developed collectively	Medium	Strategic Asset Planning Manager	60	60	80	Medium
74	People and Culture	Network and Asset Management Delivery	Review possible shared service with neighbouring authorities, including professional services	Not yet begun	Mayoral Forum, CEOs and GMs currently discussing potential areas within Council which could benefit from neighbouring authorities working together for possible shared service			Medium	Strategic Asset Planning Manager	0	0	10	Medium

10.4 MONITORING AND REVIEW

Monitoring and review of the Asset Management Plan is required to:

- Ensure compliance with the proposed improvement programme and milestones
- Ensure compliance with adopted standards and procedures for condition and performance

Council has considered and utilised the Asset Management Maturity Assessment Tool. This has been self-assessed and deemed to not require updating for the 2023 plan. The assessments from 2017 are included in Appendix 18.

The Asset Management Strategy and Policy has been reviewed and are still valid for the 2023 Long Term Plan. It is envisaged that reviews will be undertaken on a three year basis to improve quality of information and to update as necessary changes which have occurred during the period.

A Section 17A review of the activity was undertaken as part of the preparation for the procurement of the Waihopai Road Alliance contract and is included in the Appendix 12.

To ensure the plan remains useful and relevant, the following ongoing process of asset management plan monitoring and activity review will be undertaken:

- Revisions of the Asset Management Plan following consultation and adoption of the Long Term Plan.
- Review the Plan following Waka Kotahi advice on funding levels.
- Annually review and report on the progress of the Plan and associated Improvement Programme.
- Internal Audits of asset management information to ensure the integrity and cost-effectiveness of data collected.
- Periodic audits undertaken by external auditors to measure asset management performance against “best practice”.

The **annual review** includes:

- Update of appropriate financial and valuation information when required.
- Update of funding implications and any asset condition generated from asset management information systems.
- Update of status of the Improvement Programme.
- Set forward programmes for the Asset Plan development.
- Consider if customer service surveys are needed for information on assets.

The **three yearly reviews** include:

- Undertake a Section 1 review of the delivery structure.
- Review of alignment of Asset Management Plan to organisational management plan objectives, and required service levels.
- Review of structure and content of Asset Management Plan to incorporate development of improved asset management philosophy and techniques.
- Update of valuation information on a three yearly basis.
- Alignment of the Plan with the NLTP.
- Review of the Organisation Structure to align with advances in the Better Business Case approach.

10. 11. Glossary

Term	Meaning
AS/NZS	Australian Standard / NZ Standard (Specifications)
CAS	Crash Analysis System (Waka Kotahi Accident Database)
CBD	Central Business District
CDEM	Civil Defence Emergency Management
dTIMS	Deighton's Total Infrastructure Management System (Advanced Asset Modelling Software package)
EMS	Emergency Management Southland
ESG	Engineering Services Group (Councils Internal Consultant)
FAR	Financial Assistance Rate
GPS	Government Policy Statement
HPMV	High Productivity Motor Vehicles (Exceeds 44T)
MCA	Multi Criteria Analysis
MoT	Ministry of Transport
NZTA	Waka Kotahi New Zealand Transport Agency
ONF	One Network Framework
ONRC	One Network Road Classification
RAMM	Road Asset Management and Maintenance Software
REG	Road Efficiency Group
RLTP	Regional Land Transport Plan
TA or AO	Territorial Authority or Approved Organisation
TAC	Thin Asphaltic Concrete
TIO	Transport Investment Online (Waka Kotahi Access Portal)
W/C	Work Category

11. Appendices

The Appendices for all of Council's Asset Management Plans are kept separately due to the size of files for accessing. The list below highlights the appendices that relate to this Asset Management Plan and where to find them in the Corporate Appendices Register.

No.	Type	Title	Owner – BURT ref
1	Policies and Strategies	Asset Management Policy 2017	Roading – A2032407
2	Roading	Communities at Risk Register	Roading – A5004375
3	Roading	Te Ringa Maimoa ICC Road Controlling Authority Report	Roading – A4999765
4	Roading	Unsealed Road Seal Extension Policy (Draft)	Roading – A2845829
5	Roading	Roading Asset Lives – Full List	Roading – A3335064
6	Finance and Assurance	Infrastructure Risk Register	PROCESS MANAGER
7	Roading	ICC Low Cost Low Risk Bid 2024-2027	Roading – A4999766
8	Roading	2023 Forward Works Programme	Roading – A5003727
9	Roading	Pavement Performance Model Report	Roading – A4999767
10	Roading	Deficiency Database	Roading – A4481457
11	Roading	Road Safety Promotions Activity 2024-27	Roading – A5003242
12	Roading	2022 Road Maintenance Activities Delivery Mechanism Report	Roading – A4211973
13	Roading	Roading Asset Valuation June 2022	Roading – A3991873
14	Roading	Roading Valuation Peer Review Report 2022	Roading – A4016371
15	Corporate	Delegation Register 2023	Roading – A4894427
16	Roading	ONRC Summary Report	Roading – A5003450
17	Roading	Road Efficiency Group 2021- 24 AMP Review	Roading – A5003477
18	Roading	Asset Maturity Table	Roading – A2037151
19	Roading	2022/23 Bridge Report	Roading – A4850572
20	Roading	LTP Roading Budgets	Roading – A5091650
21	Roading	Draft Procedural Audit Report	Roading – A5091654
22	Roading	Draft 2023 AMP Peer Review	Roading – A5091659