SCIRT Rebuilding Infrastructure | LEARNING LEGACY

Effectiveness and Efficiency of Arrangements to Repair Pipes and Roads in Christchurch - Follow-up Audit

Story: Office of the Auditor General Reports

Theme: Governance and Decision Making

A report which details the findings of a follow-up performance audit carried out by the Office of the Auditor-General to assess the effectiveness and efficiency of arrangements to repair Christchurch's horizontal infrastructure.

This document has been provided as an example of a tool that might be useful for other organisations undertaking complex disaster recovery or infrastructure rebuild programmes.

For more information about this document, visit www.scirtlearninglegacy.org.nz

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Auditor-General's overview

The major earthquakes in 2010 and 2011 severely damaged the roads and underground freshwater, wastewater, and stormwater pipes in Christchurch. These pipes, roads, retaining walls, and bridges (horizontal infrastructure) are necessary to support basic human health needs and the future growth and economic well-being of Christchurch.

An alliance of public and private-sector entities called the Stronger Christchurch Infrastructure Rebuild Team (SCIRT) was formed to repair the damaged pipes and roads. The alliance included the Christchurch City Council (the Council), the Canterbury Earthquake Recovery Authority (CERA), the New Zealand Transport Agency (NZTA), and five construction companies. SCIRT is a temporary alliance, which is expected to finish its construction programme by 31 December 2016.

In November 2013, I published a report about how effectively and efficiently the public entities (the Council, CERA, and NZTA) were managing the rebuild of Christchurch's pipes and roads through SCIRT. In 2013, I concluded that:

- SCIRT had many of the good practice characteristics of alliancing;
- SCIRT projects seemed reasonably priced, given the circumstances; and
- SCIRT was delivering other benefits, including increasing the skill level of the construction workforce and fostering innovation.

I also found risks that the public entities needed to manage. These risks included a lack of clarity about governance roles and responsibilities, limited involvement of CERA in the governance of SCIRT, and the public entities not having a common understanding of levels of service to be delivered by the pipes and roads. I made seven recommendations to address these risks.

This follow-up report looks at the public entities' progress in addressing my recommendations. Overall, I consider that the public entities have made good progress in addressing my recommendations.

Since 2013, SCIRT has made solid progress in repairing damaged pipes and roads. At the same time, the public entities have improved the governance arrangements over SCIRT. These improvements include clearer roles and responsibilities, more effective guidance and clearer direction to SCIRT, and improvements in reporting.

The public entities faced challenges in deciding appropriate funding and levels of services for the horizontal infrastructure. In disaster recovery work, getting the balance right between competing interests is difficult.

The levels of service are now agreed, the funding arrangements are confirmed, and a second independent review of the Infrastructure Recovery Technical Standards and Guidelines has been carried out. The funding arrangements,

however, took up to 19 months to confirm, creating funding uncertainty for about 30 wastewater and stormwater projects for more than eight months.

While we were following up on the public entities' progress, my staff also took the opportunity to look at the arrangements for:

- transferring assets and information from SCIRT to the Council; and
- learning and sharing lessons from managing the rebuild of the horizontal infrastructure.

Both of these arrangements could have long-term benefits, including for the management of assets and future alliances.

As part of the rebuild, SCIRT collected a wealth of information about pipes and roads owned by the Council and NZTA. SCIRT has also set up asset information systems that the Council could benefit from. The Council has a unique opportunity to improve its understanding of the condition of its assets, which will in turn improve its future management of them. Although progress was initially slow, there has recently been promising progress in planning for the transfer of the information and preparing for the transition from SCIRT to the Council. To realise the benefits of SCIRT's work for the people of Christchurch, I encourage the Council to sustain the recent momentum, with the support of the other public entities and SCIRT.

SCIRT has a continuous improvement culture that identifies, shares, and applies lessons and innovations. The public entities need to continue actively and systematically identifying, recording, and sharing their lessons from SCIRT and the Alliance's approach, to manage the risk that their own lessons might be lost when staff leave or organisations change.

I thank staff from the Council, CERA, NZTA, and SCIRT for their help and co-operation during our follow-up audit.

Lyn Provost
Controller and Auditor-General

5 May 2016

Introduction

1.1   In this Part, we describe:

- the purpose of this follow-up report;
- what the Stronger Christchurch Infrastructure Rebuild Team (SCIRT) is and what it does;
- how we carried out our follow-up work; and
- the structure of this report.

Purpose of this follow-up report

1.2   In 2013, we carried out a performance audit to assess the effectiveness and efficiency of arrangements to repair Christchurch's horizontal infrastructure (our 2013 report).[1] Specifically, we audited how three public entities were managing the rebuild of the horizontal infrastructure[2] through an alliance called SCIRT. The three public entities managing the rebuild of Christchurch's horizontal infrastructure, which we refer to in this report as "the public entities", are:

- Christchurch City Council (the Council);
- the Canterbury Earthquake Recovery Authority (CERA)[3]; and
- the New Zealand Transport Agency (NZTA).

1.3   This report looks at the progress the public entities have made in addressing recommendations from our 2013 report, and their preparation for the future.

What the Stronger Christchurch Infrastructure Rebuild Team is and what it does

1.4   SCIRT is an alliance of three "owner participants" (the Council, CERA, and NZTA) and five "non-owner participants". CERA is a funder, and the Council and NZTA are funders and asset owners.

1.5   The five non-owner participants are City Care Limited, Downer New Zealand Limited, Fletcher Construction Company Limited, Fulton Hogan Limited, and McConnell Dowell Constructors Limited. The non-owner participants are responsible for doing the repairs. Each non-owner participant has a delivery team within SCIRT, which is responsible for completing projects within the SCIRT programme. When we refer to delivery teams in this report, we mean the teams from the five non-owner participants.

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1   Further information is available in our 2013 report, *Effectiveness and efficiency of arrangements to repair pipes and roads in Christchurch*. Available on our website: www.oag.govt.nz.

2   Horizontal infrastructure is made up of roads (including retaining walls and bridges), freshwater and wastewater pipes, and the stormwater drainage network.

3   Some of CERA's role, including relating to horizontal infrastructure repairs, is carried out by a newly formed group in the Department of the Prime Minister and Cabinet.

1.6   SCIRT is responsible for rebuilding most of the horizontal infrastructure damaged by the major earthquakes on 4 September 2010 and 22 February 2011. In 2013, the public entities set out their funding arrangements for rebuilding the horizontal infrastructure in the Cost Sharing Agreement and the Memorandum of Understanding. The Crown estimated that it would spend $1.8 billion, with CERA funding 60% of eligible costs for the water infrastructure (underground freshwater, wastewater, and stormwater pipes) and NZTA funding 83% of the roading infrastructure. The Council estimated spending of $1.14 billion under the Cost Sharing Agreement. SCIRT is a temporary alliance formed under the Alliance Agreement and is expected to finish its construction programme by 31 December 2016. Some of the work funded under the Cost Sharing Agreement to repair the horizontal infrastructure is not part of the SCIRT work programme.

1.7   Two bodies govern the SCIRT programme: the Horizontal Infrastructure Governance Group, and the SCIRT Board. Figure 1 below summarises the different roles of the two groups, their membership, and how they are chaired. See paragraphs 3.6-3.18 for more information about the governance arrangements.

Figure 1
Membership and roles of Horizontal Infrastructure Governance Group and SCIRT Board

	Horizontal Infrastructure Governance Group	SCIRT Board
Role	Governing the horizontal infrastructure rebuild defined by the Cost Sharing Agreement and the Memorandum of Understanding (which includes the work carried out by SCIRT), reviewing SCIRT's progress, and providing leadership and strategic direction.	Ensuring that SCIRT delivers its programme and meets its goals under the Alliance Agreement.
Membership	• CERA • the Council • NZTA	• CERA • the Council • NZTA • City Care Limited • Downer New Zealand Limited • Fletcher Construction Company Limited • Fulton Hogan Limited • McConnell Dowell Constructors Limited
Chaired	Independent Chairperson appointed by the Minister for Canterbury Earthquake Recovery	Elected by the SCIRT Board (they originally intended to rotate the Chairperson, but the second Chairperson has been re-elected in subsequent years).

1.8   The SCIRT Integrated Services Team is the operational arm of the Alliance that manages the SCIRT work programme by designing, costing, and overseeing construction of projects by the delivery teams. The SCIRT Integrated Services Team is made up of managers and staff seconded from the participating entities, and various consulting practices. In this report, we use 'SCIRT' to refer to the SCIRT Integrated Services Team when talking about the entities involved in delivering the SCIRT programme.

How we carried out our follow-up work

Our 2013 report

1.9   In 2013, we audited how the public entities were managing the horizontal infrastructure rebuild through SCIRT and found that:

- SCIRT had many of the good-practice characteristics of alliancing;
- SCIRT projects seemed reasonably priced, given the circumstances; and
- SCIRT was delivering other benefits, including increasing the skill level of the construction workforce and fostering innovation.

1.10   In 2013, we also highlighted some risks that needed to be managed. In particular:

- SCIRT's effectiveness was being increasingly hindered by a lack of clarity about governance roles and responsibilities, and by limited involvement from CERA in the governance of SCIRT.
- The public entities did not have a common understanding of the levels of service that the repaired horizontal infrastructure should deliver.

1.11   In our 2013 report, we made seven recommendations about how the public entities could address these risks:

We recommend that the Canterbury Earthquake Recovery Authority, Christchurch City Council, and the New Zealand Transport Agency:

1. *change the governance framework to address ambiguity about roles and responsibilities, including the role and responsibilities of the independent chairperson.*

We recommend that the Canterbury Earthquake Recovery Authority:

2. *contribute more consistently to effective leadership and strategic direction for the Stronger Christchurch Infrastructure Rebuild Team.*

We recommend that the Canterbury Earthquake Recovery Authority, Christchurch City Council, and the New Zealand Transport Agency:

3. *use the governance arrangements to provide timely guidance to the Stronger Christchurch Infrastructure Rebuild Team on the priorities and direction of the rebuild;*

4. *agree on the levels of service and quality of infrastructure that the rebuild will deliver, in conjunction with confirming funding arrangements, and consider a second independent review of the Infrastructure Recovery Technical Standards and Guidelines;*

5. *use a coherent framework for measuring key aspects of the Stronger Christchurch Infrastructure Rebuild Team's performance that integrates project-level delivery team performance with alliance objectives and overall programme delivery, and is based on sound measures tested through the Stronger Christchurch Infrastructure Rebuild Team's internal auditing regime;*

6. *ensure that their framework for auditing the Stronger Christchurch Infrastructure Rebuild Team provides them with adequate assurance that the Stronger Christchurch Infrastructure Rebuild Team is well managed and delivering value for money; and*

7. *in conjunction with strengthening performance measures, provide feedback to the Stronger Christchurch Infrastructure Rebuild Team to improve the analysis and information included in reports to the Stronger Christchurch Infrastructure Rebuild Team Board and make these reports more useful.*

1.12   This follow-up report looks at the progress the public entities have made in addressing those seven recommendations. We also assess the arrangements for transferring information and assets from SCIRT to the Council and for learning and sharing lessons. These arrangements are worth looking at because:

- a successful transfer of assets and information from SCIRT to the Council should increase the Council's understanding of the condition of its assets, which will improve the future management of these assets for the benefit of the people of Christchurch; and
- the lessons learned could inform future alliances, repairs (including in response to natural disasters), and management of horizontal infrastructure assets.

Our objectives and expectations

1.13 The main objective of our follow-up work was to assess and report on:

- how the public entities have addressed the recommendations in our 2013 report;
- the arrangements for transferring assets and information from SCIRT to the Council; and
- the arrangements for learning and sharing lessons from the horizontal infrastructure rebuild.

1.14 We expected the public entities to have made improvements as a result of our recommendations since our 2013 report, and we expected those improvements to have contributed positively to SCIRT's effectiveness and efficiency.

The scope of our work

1.15 We looked only at the SCIRT programme, which is confined to the city boundaries of the Council. We did not:

- look at repair work delivered under other arrangements or outside the Council's city boundaries;
- inspect construction work or carry out a technical review of the engineering design solutions that SCIRT uses; or
- assess the performance of the individual delivery teams or other contractors working with SCIRT.

How we carried out our work

1.16 To carry out our work, we:

- interviewed staff from the public entities and SCIRT;
- reviewed and analysed relevant documents from SCIRT and the public entities;
- reviewed external reports about SCIRT and repairing Christchurch's horizontal infrastructure; and
- analysed relevant data.

1.17 We carried out our fieldwork and analysis in mid-to-late 2015.

Structure of this report

1.18 In Part 2, we discuss the progress of repairs under the Alliance Agreement.

1.19 In Part 3, we discuss the public entities' improvements to governance arrangements (our recommendations 1-3, and 5-7).

1.20   In Part 4, we discuss the Council's position for managing horizontal infrastructure in future, and the continuous improvement practices and legacy of SCIRT.

1.21   In Part 5, we discuss the effect of decisions about levels of services and funding (our recommendation 4).

1.22   In Part 6, we discuss immediate priorities, and considerations for the future.

1.23   In those Parts where we follow up on an earlier recommendation, we describe that recommendation, what we found in our 2013 report, the changes made since our 2013 report, and our assessment of those changes. The Appendix on summarises progress in addressing our seven recommendations.

Progress in repairing pipes and roads

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2.1 In this Part, we discuss:

- the progress that has been made on repairing pipes and roads since 2013; and
- the Alliance Agreement's contribution to the horizontal infrastructure repairs.

Summary

2.2 Solid progress has been made on repairing pipes and roads (including retaining walls and bridges); by April 2016, 87% of SCIRT's repairs were complete.

2.3 The Alliance Agreement contributes to the effective and efficient rebuilding of the horizontal infrastructure assets. For example, the Alliance Agreement sets out how work should be allocated to delivery teams. Delivery teams now focus more on collaboration than competition for allocation of work. To date, the delivery teams have delivered work under budget.

Progress and changes since 2013

Solid progress has been made on repairing pipes and roads; by April 2016, 87% of SCIRT's repairs were complete. Since 2013, there have been changes in the staff and organisational structure of CERA and the Council.

2.4 In 2013, SCIRT had been established for two years. From May 2011 to October 2013, SCIRT had completed repairs to 200 km of wastewater pipes, 12 km of stormwater pipes, 42 km of freshwater pipes, and 279,576m^2 of roads. By April 2016, 87% of SCIRT's horizontal infrastructure repairs were complete. Figure 2 shows the progress made by SCIRT by October 2013 and by April 2016.

Figure 2
Amount of repair work completed by SCIRT by October 2013 and by April 2016

Type of repair	Amount completed by October 2013	Amount completed by April 2016
Wastewater pipes	200 km	533 km
Stormwater pipes	12 km	56 km
Freshwater pipes	42 km	91 km
Roading	279,576m^2	1,384,236m^2

Source: SCIRT.

2.5   Although the public entities involved have remained the same, there have been changes in staff and structure for both CERA and the Council. For example, at the local government elections in October 2013, a new Mayor and nine new councillors were elected. Also, the Council staff involved in horizontal infrastructure work underwent two restructurings. CERA was disestablished in April 2016, and its work distributed to other public entities. Some of CERA's role, including relating to horizontal infrastructure repairs, is carried out by a newly formed group in the Department of the Prime Minister and Cabinet.

The Alliance Agreement is mostly working as intended

The Alliance Agreement continues to contribute to the effective and efficient rebuilding of the horizontal infrastructure assets. Changes to the allocation of work to delivery teams means there is now more focus on collaboration than competition. Delivery teams are allocating more than the required minimum amount of work to subcontractors, and delivery teams have been delivering work under budget.

2.6   The Alliance Agreement encourages competition and collaboration between delivery teams in three ways: the method for allocating work to delivery teams (see paragraphs 2.7-2.13), allocating a minimum amount of work by cost to subcontractors (see paragraphs 2.14-2.16), and the "pain/gain" mechanism (see paragraphs 2.17-2.20).

Changes to allocation of work to delivery teams

2.7   Project allocation is part of the system of penalties and incentives in the Alliance Agreement to foster desirable behaviours and constrain cost inflation. Effective project allocation is important because it supports good performance in delivery teams.

2.8   The model for allocating work to delivery teams has two parts. Part A involves calculating a combined performance score for each delivery team. SCIRT calculates the score by assessing delivery teams' performance in five key result areas, as shown in Figure 3, to produce a delivery performance score. SCIRT then combines the delivery performance score with time and cost measures to form the combined performance score, which determines the target percentage of work to be allocated to each delivery team by cost (the target allocation).

2.9   In applying Part B of the model, SCIRT considers factors that might influence why a delivery team should not be allocated a project. These factors include the delivery team's available capability and capacity, proximity to a project, and safety performance.

Figure 3
Weighting of performance in key result areas for the delivery performance score, 2012 to 2015

Key result area	Weighting
Safety	0%*
Value	35%
Our team	20%
Customer satisfaction	30%
Environmental	15%

* Because SCIRT considers safety as a separate factor in Part B, it has a weighting of 0% in Part A.
Source: SCIRT.

2.10   Some delivery teams are getting more work than their target allocation, while other delivery teams are getting less. The difference in the percentage between the target allocation and the actual allocation of work has fluctuated over time. Figure 4 shows the how much the actual allocation varied from the target allocation for each delivery team from July 2013 to February 2016.

Figure 4
Variation of actual allocation from the target allocation for each delivery team from July 2013 to February 2016.

The line for each delivery team shows how much their actual allocation was either over or under their target allocation. A negative percentage means SCIRT is allocating less work to a delivery team than its target allocation. A positive percentage means SCIRT is allocating more work to a delivery team than its target allocation. For example, Delivery Team D was allocated 7.7% more work than its target allocation in May 2015.
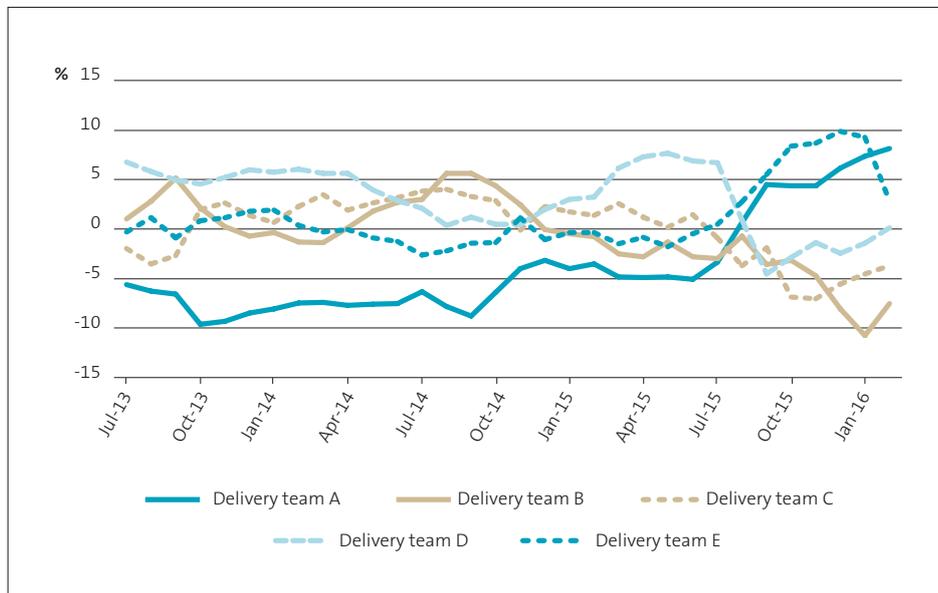
Source: SCIRT.
The letters assigned to the delivery teams for Figure 4 are different from those assigned for Figure 5.

2.11   The variation in the range is because the value of individual projects vary, making it difficult to allocate the exact amount of work by cost needed to give a delivery team its target allocation. Aligning the target and actual allocation also depends on funding being available, and the public entities approving individual projects for SCIRT to allocate to the delivery teams. Allocation was interrupted during the optimisation exercise (which reprioritised projects within the programme's remaining funds — see paragraph 5.16) and when the public entities put some projects on hold as a result of funding disagreements (see paragraphs 5.20-5.24).

2.12   In June 2015, the SCIRT Board approved a revision to the process of allocating work to delivery teams. The change was needed so SCIRT could complete the full programme of work before December 2016. The revision put more emphasis on Part B of the allocation process. This places weight on available capacity, capability, and the best outcomes for the programme rather than on delivery performance. It is too early to tell what effect the revision to the process of allocating work will have on the programme.

2.13   In our view, work has largely been allocated consistently with the Alliance Agreement. We consider the variations are understandable in the light of interruptions during the optimisation exercise and the funding disagreement, and the shift in focus needed to complete the work programme.

Work is allocated effectively to subcontractors

2.14   Under the Alliance Agreement, a minimum of 40% of the work completed by SCIRT, calculated by cost, must be subcontracted to parties outside SCIRT. The Alliance Agreement states that a competitive process must be followed to select subcontractors. The delivery teams are responsible for ensuring that subcontractors meet the same standards of operation and key result areas as they do.

2.15   Allocating a minimum amount of work to subcontractors helps to:

•   maximise competition for work within SCIRT on the basis of price; and

•   increase the capability and capacity of the subcontractors for the benefit of the construction industry.

2.16   As at September 2015, the delivery teams have been subcontracting 63.4% by overall cost of the work completed. Figure 5 shows the percentage of work subcontracted by each delivery team. All the delivery teams are subcontracting at least 40% of the work by cost. The lowest percentage is 48.6%, and the highest is 78.7%. This involvement of subcontractors is expected to increase skills and expertise in the construction industry, and to ensure competitive pricing of work.

Figure 5
Percentage of SCIRT work done by subcontractors, by cost and delivery team, as at September 2015

Delivery team	Percentage of SCIRT work subcontracted (by cost)
A	48.6%
B	53.8%
C	78.7%
D	60.7%
E	72.0%
Overall	**63.4%**

Source: SCIRT.

The letters assigned to the delivery teams for Figure 5 are different from those assigned for Figure 4.

Delivery teams deliver work under budget

2.17   The "pain/gain" mechanism in the Alliance Agreement is an incentive payment determined by financial and service performance. If the actual cost of a project is less than the target cost (the estimated cost of completing a project), a "gain" is created. If the actual cost is greater than the target cost, a "pain" is created.

2.18   The pain/gain payment is calculated at the end of the programme by adding up the pain/gain outcomes for every project. This is then shared 50/50 between the public entities and the delivery teams. The delivery teams' 50% share of the pain/gain is adjusted by the overall performance score (a score generated by the delivery teams' collective performance against the key result areas), and shared between each delivery team in proportion to the target cost value of the work they completed.

2.19   The purpose of the pain/gain mechanism is to motivate delivery teams to achieve the best cost results. The pain/gain mechanism is also meant to facilitate collaboration and encourage delivery teams to assist under-performing delivery teams to ensure that the final result will be a "gain", rather than a "pain".

2.20   The delivery teams have been steadily improving their performance in delivering work that is under budget. Figure 6 shows the estimated pain/gain position over time. A gain position is a negative amount because the actual cost is lower than the budgeted cost for all completed projects. The opposite also applies. Over time, there has been a shift from a "pain" position to a "gain" position.

Figure 6
Estimated pain/gain positions for the end of the programme based on work completed
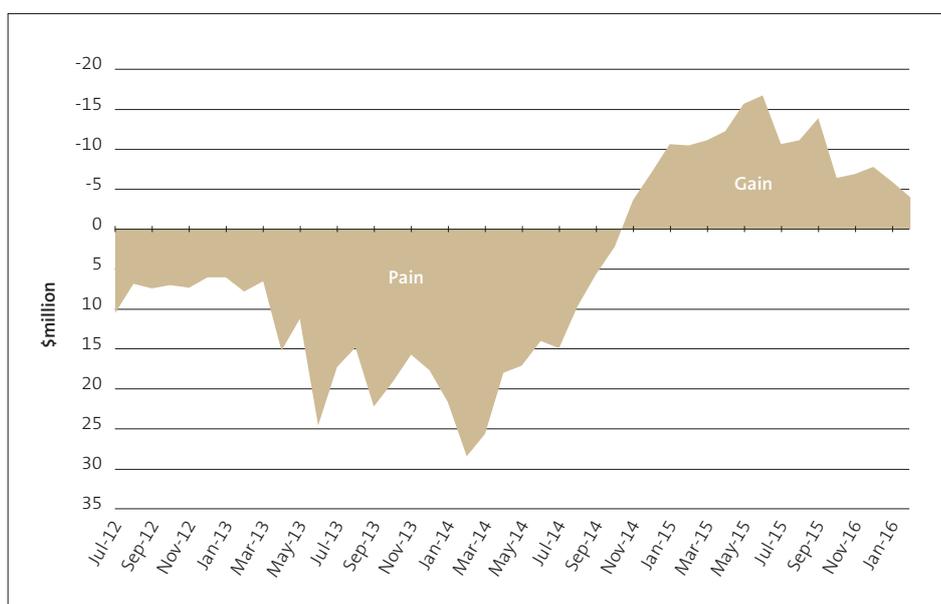
Source: SCIRT.

SCIRT delivers value, but there are some concerns

2.21   Overall, the public entities told us they were getting good value from SCIRT. In our 2013 report, we found that, when relevant variables are considered, SCIRT projects seemed reasonably priced. After our 2013 report, the public entities commissioned a consultant and an engineering firm to review the process SCIRT uses to estimate the cost of each project. The review, completed in September 2014, found that "… the construction costs of the rebuild being undertaken by SCIRT are fair and reasonable and delivering good value for money under the prevailing circumstances."

2.22   The public entities considered SCIRT (and its predecessor, the Infrastructure Rebuild Management Office[4]) was an appropriate model for the emergency and post-response phases. However, some interviewees felt it would have been helpful if SCIRT had done an assessment of whether SCIRT continued to be appropriate after these phases.

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4   Further information is available in Appendix 1 of our 2013 report, *Effectiveness and efficiency of arrangements to repair pipes and roads in Christchurch,* which is available on our website www.oag.govt.nz.

2.23   SCIRT considers that the work allocation process has worked well. However, SCIRT also considers that early in the programme, delivery teams focused on maximising their delivery performance score against the other delivery teams so SCIRT would allocate more work to them. This meant that the delivery teams were less collaborative. We were told that this might have been because delivery teams initially understood the competitive elements of the Alliance better than the collaborative elements.

2.24   In our view, the Alliance Agreement has mostly worked as intended. However, there are lessons to be learned in understanding how the different incentives interact and affect the behaviours of the delivery teams. See, for example, the situation described in paragraph 2.23.

2.25   In our 2013 report, we said that, as circumstances change, the public entities need to consider whether the Alliance continues to be suitable. Each natural disaster will have its own complexities that will need to be taken into account when considering who will deliver the rebuild and how. In future responses to natural disasters, it would be worthwhile to consider the appropriateness of the delivery vehicle at each stage of the recovery.

Progress in improving the governance arrangements

3

3.1 In this Part, we discuss the public entities' progress in addressing our 2013 recommendations to improve SCIRT's governance arrangements. In particular, we discuss:

- roles and responsibilities;
- leadership and strategic direction;
- guidance to SCIRT;
- the performance framework;
- the audit framework; and
- reporting to public entities.

Summary

3.2 We made six recommendations about SCIRT's governance arrangements in our 2013 report (recommendations 1-3 and 5-7). We describe progress of these in this Part. Progress on the remaining recommendation about levels of service and funding arrangements is covered in Part 5.

3.3 The public entities have made good progress in addressing our recommendations about governance. In particular:

- there is greater clarity about roles and responsibilities within the governance framework;
- the public entities now provide effective leadership and clearer direction;
- there is improved guidance and direction to SCIRT (although SCIRT has been hampered to some degree by the time taken to make decisions about the wider rebuild of Christchurch);
- the performance framework that the public entities use to assess SCIRT's performance is meeting the public entities' needs;
- the audit framework (a plan of audits looking at horizontal infrastructure work) provides adequate assurance to the public entities; and
- the public entities provide feedback to SCIRT on reporting and it has improved.

3.4 However, there are instances of the public entities not providing timely guidance through the governance arrangements. For example, the Horizontal Infrastructure Governance Group was hampered in giving timely direction to SCIRT because of the time the public entities are taking to make decisions about the wider rebuild.

3.5 Overall, good governance from the public entities is helping to ensure that SCIRT delivers the right infrastructure, at the right time, at the right cost.

Roles and responsibilities are clearer

The public entities have improved the governance framework by clarifying roles and responsibilities. The governance framework now meets the needs of the SCIRT programme better.

3.6   In 2013, we found a lack of clarity about the roles of the Client Governance Group and the independent Chairperson. The SCIRT Board's role was also unclear. We recommended that CERA, the Council, and NZTA change SCIRT's governance structure to address these issues.

Changes to governance groups

3.7   The public entities put in place new governance arrangements in late 2013. The public entities replaced the Client Governance Group with the Horizontal Infrastructure Governance Group. As part of this change, the Horizontal Infrastructure Management Team was formed to provide secretariat support and independent advice to the Horizontal Infrastructure Governance Group. Figure 7 shows the current governance arrangements, and Figure 8 shows the previous arrangements.

Figure 7
SCIRT's governance arrangements in 2016
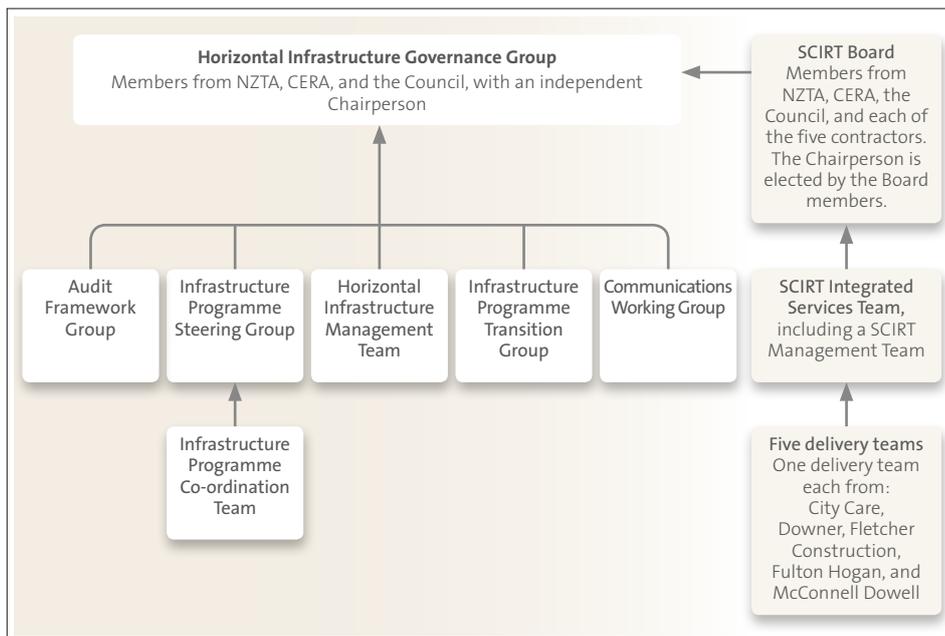
3.8   The public entities made other changes to SCIRT's governance arrangements as the needs of the horizontal infrastructure rebuild changed. In August 2014, the Horizontal Infrastructure Governance Group agreed to form the Infrastructure Programme Co-ordination Team and the Infrastructure Programme Steering Group to improve programme governance.[5] In November 2015, the Horizontal Infrastructure Governance Group endorsed the terms of reference for the Infrastructure Programme Transition Group to plan and monitor the transition (see paragraphs 4.8-4.21) from SCIRT to the Council.[6]

Figure 8
SCIRT's governance arrangements in September 2013
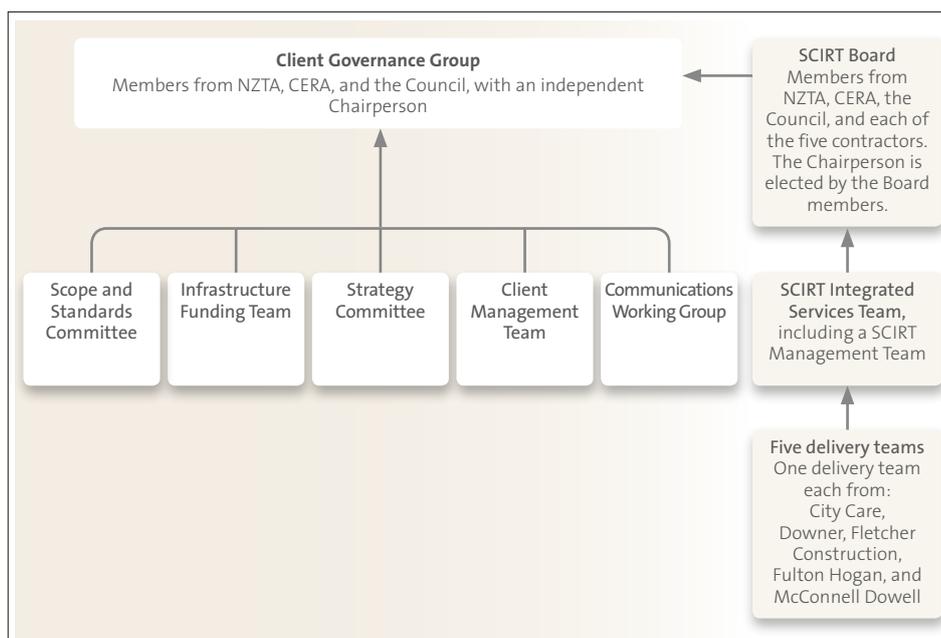
3.9   Changes to the governance structure have led to greater clarity about roles and responsibilities. In September 2013, the public entities signed a memorandum of understanding setting out the roles and responsibilities of the Horizontal Infrastructure Governance Group. The memorandum and a letter of expectations from the Minister for Canterbury Earthquake Recovery clearly set out the independent Chairperson's responsibilities. The agenda for each meeting of the Horizontal Infrastructure Governance Group sets out the roles and responsibilities for the Infrastructure Programme Steering Group and the Infrastructure Programme Co-ordination Team.

5   The Infrastructure Programme Co-ordination Team confirm that project designs accord with approved guidelines and direction from the public entities. The Infrastructure Programme Steering Group reviews, approves, and endorses projects as appropriate within the delegated authority provided by the Horizontal Infrastructure Governance Group.

6   The Infrastructure Programme Transition Group's purpose is to provide transition planning and management of the horizontal infrastructure Transition Implementation Plan.

3.10   A Gateway review[7] in May 2015 of CERA's involvement in the horizontal infrastructure rebuild programme found that interviewees had different views on whether the Horizontal Infrastructure Governance Group was a decision-making body. In response, CERA wrote to the public entities and SCIRT staff involved in the horizontal infrastructure rebuild to clarify the Horizontal Infrastructure Governance Group's role.

3.11   Staff of the public entities and SCIRT clearly and consistently described the roles of the governance groups and teams associated with SCIRT when we interviewed them in late 2015. They also understood how the roles of these groups differed from the roles of SCIRT and the SCIRT Board.

3.12   The Horizontal Infrastructure Governance Group and SCIRT Board invested significant effort in clearly defining their respective roles and building a common understanding of the strategic direction for SCIRT. They did this through joint strategic meetings and discussions at the Horizontal Infrastructure Governance Group's monthly meetings with the Chairperson of the SCIRT Board and the Executive General Manager of SCIRT. These practices should mean the right people make the right decisions at the right time.

Independent Chairperson of the Horizontal Infrastructure Governance Group

3.13   On 14 November 2013, the Minister for Canterbury Earthquake Recovery wrote to the former independent Chairperson of the Horizontal Infrastructure Governance Group setting out the expectations for the role. The Chairperson was required, for example, to manage issues that arise between the public entities and escalate them if necessary. The former Chairperson was also required to complete a declaration about any potential conflicts of interest, and advise if the situation changed.

3.14   The current Chairperson carried out the role on a temporary basis while the former Chairperson was unwell, and was appointed full time in 2014. The current Chairperson was also an employee of CERA until it was disestablished in April 2016. There was, therefore, potential for conflicts of interest to arise because the Chairperson had responsibilities and duties as both the independent Chairperson of the Horizontal Infrastructure Governance Group and an employee of CERA.

3.15   The current Chairperson received a copy of the Minister's letter of expectations to the former Chairperson when he was appointed to the role permanently. There is no documentation recording the terms of his appointment or showing that the potential for conflicts of interest to arise was considered at the time.

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7   A Gateway review is a short, intensive review managed by the Treasury at critical stages in the life of a project and at intervals during a programme.

3.16   The current Chairperson told us that, when he was appointed, he spoke with each of the members of the Horizontal Infrastructure Governance Group to discuss the potential for conflicts of interest to arise, and the appropriateness of him carrying out the role. None of the people we interviewed from the Horizontal Infrastructure Governance Group, public entities, or SCIRT raised any specific concerns about the way he is carrying out his role. The current Chairperson managed his potential conflict by not taking part in any discussions or meetings about horizontal infrastructure in his capacity as an employee of CERA. His involvement with horizontal infrastructure issues is, therefore, limited to his role on the Horizontal Infrastructure Governance Group.

3.17   If a conflict of interest arises, it does not necessarily mean that someone has done something wrong, and it need not cause problems. The conflict simply needs to be identified and managed carefully. As noted above, none of the people we interviewed from the Horizontal Infrastructure Governance Group, public entities, or SCIRT raised any specific concerns about how the current Chairperson is carrying out his role. Nor did we receive any evidence suggesting actual conflicts had arisen.

3.18   Although we appreciate the need for agility and responsiveness during disaster recovery in Christchurch, we expected there to be clear documentation appointing the Chairperson, and indicating how potential conflicts of interest would be managed at the time of his appointment. The current Chairperson was appointed in mid-2014, but there is still no documentation to this effect. We encourage all public entities to actively identify and manage potential and actual conflicts of interest, as part of good governance practice.[8]

There is more effective leadership and clearer strategic direction

CERA is more involved and the public entities now provide more effective leadership and clearer strategic direction.

3.19   In 2013, we found that CERA did not consistently send the same people to meetings of the SCIRT Board and the Client Governance Group. Some representatives from CERA did not have similar delegations to representatives from the Council and NZTA, which contributed to slower approval processes. We considered that CERA could not effectively co-ordinate and direct the wider rebuild if it did not get fully involved in governing SCIRT.

3.20   We recommended that CERA contribute more consistently to the effective leadership of, and strategic direction for, SCIRT. For our follow-up audit, we applied

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8   Office of the Auditor-General (2007), *Managing conflicts of interest: Guidance for public entities*, Wellington, especially Part 4. Available on our website www.oag.govt.nz.

this recommendation to all the public entities, because they all need to contribute consistently to governing SCIRT for it to succeed.

3.21 Leadership and direction from the public entities has improved since the Horizontal Infrastructure Governance Group was set up. The Horizontal Infrastructure Governance Group sets clear goals for the programme. For example, the public entities set goals and provided strategic direction through the optimisation exercise in 2014 to reprioritise projects within the programme's remaining funds (see paragraph 5.16).

3.22 The public entities keep SCIRT informed about the strategic direction of the wider rebuild and give regular guidance to SCIRT through multiple channels. SCIRT receives guidance from the Horizontal Infrastructure Governance Group, the Infrastructure Programme Co-ordination Team, and the Infrastructure Programme Steering Group.

3.23 For example, the Chairperson of the SCIRT Board and SCIRT's Executive General Manager attend the Horizontal Infrastructure Governance Group meetings to present a report to the meeting and discuss the main issues for action or resolution.[9] Joint strategic workshops between the Horizontal Infrastructure Governance Group and the SCIRT Board inform SCIRT about the strategic direction of the horizontal infrastructure rebuild and the wider rebuild.

3.24 The representatives of the Horizontal Infrastructure Governance Group and the SCIRT Board consistently attend meetings. However, changes in staff at CERA and the Council have meant that there has not been continuity of membership, but there is always representation from these two entities. We appreciate the staffing challenges involved. However, we encourage the public entities to manage this carefully to ensure continuity at meetings during the remaining stages of SCIRT. Having continuity at meetings allows members to build their knowledge and relationships.

3.25 Although the people attending meetings has changed recently, interviewees did not raise concerns about this. In the views of the public entities, the attendees' delegations were consistent with what was required for Horizontal Infrastructure Governance Group and SCIRT Board meetings. In our view, the public entities are now providing more effective leadership and strategic direction.

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9 Generally the NZTA representative on the SCIRT Board also attends the Horizontal Infrastructure Governance Group meeting with the Chairperson of the SCIRT Board and SCIRT's Executive General Manager.

Guidance is provided to the Stronger Christchurch Infrastructure Rebuild Team

Guidance is provided to SCIRT at governance and operational levels. However, the Horizontal Infrastructure Governance Group was hampered in giving timely direction to SCIRT because of the time taken by the public entities to make some decisions about the wider rebuild of Christchurch.

3.26   In our 2013 report, we said that SCIRT's planning was ahead of other public entities working on the rebuild. We also said that the co-ordination between SCIRT and CERA was problematic. The lack of integration with the wider rebuild hindered SCIRT's ability to do the right thing, at the right time, to the right standard. To address this, we recommended that CERA, the Council, and NZTA use the governance arrangements to provide timely guidance to SCIRT about the priorities and direction of the rebuild.

3.27   The public entities now give SCIRT improved guidance through the governance groups. This includes through Horizontal Infrastructure Governance Group meetings, instructions from the Horizontal Infrastructure Management Team, and advice from other governance groups. SCIRT also requests guidance and direction from the governance groups. For example, in June 2015, SCIRT asked for direction on several matters from the Horizontal Infrastructure Governance Group so they could plan their programme.

3.28   At an operational level, the public entities provide guidance through information-sharing tools, liaison, and planning. The "Forward Works Viewer" is a software programme that allows users, including SCIRT, to see links between the repair of the horizontal infrastructure and the wider rebuild. The Forward Works Viewer shows details of current and planned projects, including information about what stage each project is at and which projects might clash.

3.29   The Construction Management Office (formerly of CERA) co-ordinates the central city rebuild with partners and stakeholders, including SCIRT and utility providers. SCIRT and the public entities used a delivery management plan to co-ordinate their work in the central city. This work is mostly complete.

3.30   However, the Horizontal Infrastructure Governance Group was hampered in giving timely direction to SCIRT because of the time taken by the public entities to make decisions about some of the wider rebuild work. For example, the time taken to make decisions about the future use of residential red zone properties contributed to about four to six projects being reduced in scope so the SCIRT programme can be completed by December 2016.

3.31   The Horizontal Infrastructure Governance Group needs to manage the risks associated with the time taken in decision-making. Although guidance at the operational level is good, the time taken by the public entities to make decisions about the rebuild means that SCIRT's work is not fully integrated with the wider rebuild.

The performance framework is meeting the public entities' needs

The public entities use a performance framework to assess SCIRT's performance that meets the needs of the programme.

3.32   In 2013, we found that the public entities had not fully prepared a performance framework to monitor SCIRT's performance. For example, SCIRT and the public entities were still working on ways to define the value of SCIRT and to measure its performance.

3.33   A form of earned-value reporting was being prepared to provide a more strategic view of progress.[10] We recommended that CERA, the Council, and NZTA use a coherent framework for measuring the main aspects of SCIRT's performance that:

- integrates project-level delivery team performance with the objectives of the Alliance Agreement and overall programme delivery; and

- is based on sound measures, tested through SCIRT's auditing regime.

3.34   The Horizontal Infrastructure Governance Group now has a clear framework for measuring SCIRT's performance. SCIRT and the delivery teams measure and report their performance against the five key result areas in the Alliance Agreement – safety, customer satisfaction, ensuring value for money, minimising environmental impact, and promoting a strong positive team culture. This performance information is reported to the SCIRT Board and included in the monthly report from the SCIRT Board to the Horizontal Infrastructure Governance Group along with information such as earned-value analysis and progress against budget.

3.35   The Horizontal Infrastructure Management Team and CERA report to the Horizontal Infrastructure Governance Group on SCIRT's performance separately. These reports integrate overall programme delivery with project-level delivery. In its reports, the Horizontal Infrastructure Management Team gives its view on the main issues for the horizontal infrastructure rebuild and on SCIRT's performance.

3.36   CERA provides a "dashboard" report to the Horizontal Infrastructure Governance Group showing SCIRT's performance against measures of effectiveness, efficiency, and economy. The dashboard report includes CERA's earned-value analysis

10   The earned-value reporting data is combined from individual projects to provide the programme overview.

(based on data from SCIRT) to show overall programme delivery against time and cost. Combined with reporting from SCIRT and the Horizontal Infrastructure Management Team, this gives the Horizontal Infrastructure Governance Group what it needs to monitor SCIRT's performance.

3.37   In our 2013 report, we recommended that SCIRT's internal auditing regime test the performance measures. SCIRT regularly reviews its key performance indicators (its performance measures) to ensure that they are fit for purpose. The SCIRT Board approves changes to the indicators. SCIRT also checks the information that is provided by the delivery teams on how they are performing against the key performance indicators.

3.38   SCIRT made changes in June 2015 to encourage behaviours appropriate for the final phase of the SCIRT programme. For example, a new key performance indicator was created within the environmental management key result area to encourage delivery teams to submit lessons learned, good practices, and case studies, so they can be shared with the wider construction industry.

3.39   In August 2014, a consultant found that the information SCIRT and the Council provided to CERA and the Horizontal Infrastructure Governance Group was accurate and timely enough for the Horizontal Infrastructure Governance Group to make good decisions. The consultant found that SCIRT's reporting to the public entities enabled them to meet reporting requirements to monitoring agencies, such as the Treasury.

3.40   The consultant also identified areas for improvement. In particular, the consultant thought the Horizontal Infrastructure Management Team needed to play a greater role in collating reporting for the Horizontal Infrastructure Governance Group and in ensuring that reported information was tested for accuracy. In response, the Horizontal Infrastructure Management Team agreed with the consultant's recommendations, including playing a greater role in collating the reporting and working collaboratively with staff at the Council and SCIRT to test the reporting for accuracy.

3.41   The consultant's conclusions were consistent with what we found. Interviewees thought the quality of reporting and the performance framework was good but raised concerns similar to those raised by the consultant. Despite these concerns, we consider that the overall performance framework meets the public entities' current needs.

The public entities receive assurance from the audit framework

The public entities have an audit framework that provides them with adequate assurance. The audit framework is regularly updated based on the risks to the horizontal infrastructure rebuild.

3.42   In 2013, we reported that the proposed audit framework had good coverage of important SCIRT systems and processes and that implementing the audit framework would provide a much needed layer of assurance. We recommended that CERA, the Council, and NZTA ensure that their framework for auditing SCIRT provides adequate assurance that SCIRT is well managed and delivering value for money.

3.43   The public entities now have an audit framework that consists of 20 audits. As at April 2015, 14 audits have been completed, and eight of the completed audits are being followed up. Audits can be done by internal auditors from the public entities or an external audit provider. This framework is separate from SCIRT's own internal auditing regime.

3.44   The Horizontal Infrastructure Governance Group formed the Audit Framework Group to manage and report on the risk and assurance framework (including the audit framework). The Group, with members from CERA, the Council, NZTA, and the Horizontal Infrastructure Management Team, reviews completed audits before their summaries are sent to the Horizontal Infrastructure Governance Group. The Horizontal Infrastructure Governance Group discusses the audit and SCIRT's response to the findings. The Audit Framework Group also reviews and updates the audit work programme and identifies shared risks to the horizontal infrastructure rebuild.

3.45   The public entities continually review and revise the audit framework to improve and target the assurance it provides. For example, in April 2015, the public entities started a review of the audit framework. They conducted a risk workshop and updated the shared risk register for the horizontal infrastructure rebuild. The Horizontal Infrastructure Governance Group then gave its feedback on the updated risk register, and the Audit Framework Group revised the audit plan to cover the main risks. The Horizontal Infrastructure Governance Group also regularly receives reports from the Audit Framework Group, and it reviews the audit framework and work plan at its meetings.

3.46   In 2014, CERA commissioned a consultant to review the audit framework to see whether it provided the right level of assurance. The consultant:

- found that the audit framework was structured around addressing key questions based on key risk areas for the programme funders and asset owners;

- found that the scope of the framework, if delivered as designed, would cover the key risk areas; and

- made observations and recommendations to CERA and the other public entities on minor issues. For example, it recommended that there should be a process to follow up on completed audits.

3.47   SCIRT responds to audit recommendations and often resolves issues before audit reports go to the Horizontal Infrastructure Governance Group. SCIRT staff said the audit framework and practices had improved as the auditors gained a better understanding of SCIRT. However, they had some concerns about the usefulness of some audits. For example, there are differences of opinion about whether auditors have raised issues that pose a high risk and have a major effect on the effectiveness of SCIRT. However, all audits under the audit framework follow a risk matrix that the public entities have agreed on.

3.48   The public entities said the audit framework gave them adequate assurance that SCIRT is well managed and delivering value for money. They also identified some areas for improvement, including receiving more assurance about financial information. To strengthen the audit framework, we encourage the public entities to look into concerns raised about both financial reporting and how they decide risk levels for specific issues.

There has been ongoing improvement in reporting

The public entities provide feedback to SCIRT on reporting, and reporting has improved as a result.

3.49   In 2013, we found that the reporting to the Client Governance Group (now replaced by the Horizontal Infrastructure Governance Group) and the SCIRT Board was detailed and involved a lot of paper. The reporting did not help the governance bodies understand how well SCIRT was performing at a programme level. We recommended that CERA, the Council, and NZTA provide feedback to SCIRT to improve the analysis and information included in reports to the SCIRT Board, to make these reports more useful.

3.50   SCIRT has received feedback from the Horizontal Infrastructure Governance Group, the SCIRT Board, and the public entities to help improve the quality of its reporting. SCIRT has changed its reports in response to this feedback.

3.51   As a result, SCIRT's reports to the Horizontal Infrastructure Governance Group now include information about SCIRT's performance against health and safety measures, and the status of assets being handed over to the Council. Staff from SCIRT told us the public entities' feedback on reporting was useful, and that they had good communication with staff from the public entities.

3.52   The Horizontal Infrastructure Governance Group and the SCIRT Board consider that SCIRT's reporting now meets their needs better. Interviewees said the reporting is of higher quality. However, some concerns were raised about the reporting not explaining changes in financial figures from month to month well enough. Over time, SCIRT has increased its discussion of major financial movements between months in its monthly report to the Horizontal Infrastructure Governance Group.

3.53   In our view, although feedback has resulted in improved reporting, the Horizontal Infrastructure Governance Group and the SCIRT Board will need to consider whether reporting on financial information needs to be changed for the rest of the programme.

Transfer of assets and information, and sharing and applying lessons

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4.1 In this Part, we discuss the:

- transition of information from SCIRT to the Council;
- handover of horizontal infrastructure assets from SCIRT to the Council; and
- risk and opportunities for identifying, sharing, and applying lessons for the future.

Summary

4.2 As part of our follow-up work, we looked at the arrangements for transferring information from SCIRT to the Council. We also looked at the handover of assets from SCIRT to the Council after projects have been completed. This is important because, if the Council has greater knowledge about the condition of its assets, it can manage its assets more effectively and efficiently for the benefit of the people of Christchurch.

4.3 Recently more promising progress has been made in planning the transfer of information from SCIRT to the Council about its assets. The main challenge is that the Council's current systems are not readily able to use the information from SCIRT.

4.4 Handover of assets from SCIRT to the Council was not meeting targets in 2014 to early 2016. However, there have been recent improvements.

4.5 As part of our follow-up work, we also decided to look at how the public entities and SCIRT are recording and sharing lessons learned. This is because lessons from SCIRT are relevant to future alliances, asset management, responses to future natural disasters, and innovation in delivering horizontal infrastructure.

4.6 We found that SCIRT is:

- identifying many lessons about managing and delivering a horizontal infrastructure rebuild;
- encouraging continuous improvement by sharing these lessons; and
- applying some of the lessons.

4.7 The public entities need to continue their work in actively and systematically identifying, recording, and sharing their lessons from SCIRT and the Alliance approach. The public entities also need to manage the risk that their own lessons might be lost when staff leave or organisations change.

Preparing to transfer information to better manage horizontal infrastructure assets

Promising progress has recently been made in planning the transfer of information to the Council. The Council has a unique opportunity to be in a strong position to improve its understanding of the condition of its assets, which will in turn improve the future management of assets. Recent momentum needs to be sustained to fully realise this opportunity.

4.8   Transferring information from SCIRT to the Council involves several challenges. These include:

- The Council's current systems are not readily able to use the information from SCIRT.

- The asset condition information from SCIRT will become dated over time (and decrease in value) if it is not updated.

- The Council's staff need the right training to effectively use any new technology, systems, and processes.

- The Council and entities need to manage the risks associated with the transfer of information.

4.9   If the Council does not change its systems and processes, it will not fully realise the value of SCIRT's information and systems.

4.10   During our fieldwork in mid-to-late 2015, we found that there had been limited progress after planning workshops involving Council and SCIRT staff held in July 2014. The Council had set up a group in 2014, prepared a definition of the problem, and prepared a business case. Interviewees, however, expressed concern about the pace of the Council's progress in planning for the transfer and inadequate communication about the transfer.

4.11   Since the public entities and SCIRT held a workshop in October 2015, there has been more promising progress. The public entities and SCIRT have agreed on what success will look like, and have agreed on a range of workstreams covering:

- physical delivery of SCIRT and non-SCIRT programmes;

- data information systems;

- contractual close-out of SCIRT (this covers the administrative activities required after construction is finished to verify that parties have fulfilled their obligations);

- learning and legacy, including the story of SCIRT, horizontal infrastructure, and the horizontal infrastructure programme;

- preparing the Council for success, including adopting different asset information and management policies, systems, and practices;

- communications and stakeholder management; and

- governance arrangements.

4.12   After the workshop, the Infrastructure Programme Transition Group was set up, with members from the public entities and SCIRT. In November 2015, the Horizontal Infrastructure Governance Group endorsed the Infrastructure Programme Transition Group's terms of reference, and its purpose to provide transition planning and management of the Transition Implementation Plan.

4.13   In March 2016, the Infrastructure Programme Transition Group confirmed which entity is responsible for each workstream and the Infrastructure Programme Transition Group's role in relation to each workstream, noted high-level risks for transition work, and prepared a Transition Implementation Plan. The Horizontal Infrastructure Governance Group endorsed the Transition Implementation Plan at its meeting on 22 March 2016.

4.14   The transition implementation phase is scheduled for April 2016 to June 2017. This takes into account the close-out period[11] after construction work (scheduled to be finished in December 2016). Detailed deadlines are prepared by the entities responsible for each workstream, and monitored by the Infrastructure Programme Transition Group.

4.15   The Council is doing a range of work to prepare itself for the transition. For example, the Council is having joint workshops with SCIRT to learn more about SCIRT's work, including about SCIRT's high-level operational processes, and the interactions and dependencies between SCIRT systems.

4.16   The transition work is broader than transferring information from SCIRT to the Council. It also includes ensuring that the Council is in a sound position to use that information for the benefit of Christchurch. In July 2015, the Council started the Advancing Asset Management Programme to help the Council increase its capability to deliver and maintain assets through their life cycles. The Council will revisit its draft business case in 2016, because of the Transition Implementation Plan and changes from the Council's recent restructuring. In the meantime, the Council is seconding some staff to SCIRT to get practical experience of how SCIRT works.

4.17   In our view, the Council needs to sustain its recent momentum to realise the full benefits of SCIRT's information and work. To do this, it needs the support of the other public entities, SCIRT, the Infrastructure Programme Transition Group, and the Horizontal Infrastructure Governance Group.

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11   The close-out period is for practical completion certification and payment. This is when the SCIRT has completed all repairs to practical completion. Practical completion means that the repairs can be used for their intended purpose without material inconvenience, and that the repairs are complete except for minor defects and minor omissions that are still to be completed.

Handover of assets not meeting targets

Handover of assets from SCIRT to the Council was not meeting targets. However, there have been recent improvements.

4.18   SCIRT aims to complete the handover of assets within 90 days of projects being completed. When a delivery team completes a project, that team and SCIRT prepare the assets for transfer to the Council (the asset owner). This includes collating information about the specifications and location of the assets.

4.19   The handover of assets from SCIRT to the Council has not met SCIRT's targets. SCIRT and the delivery teams have improved the handover process but, as at February 2016, 17 individual projects (out of 43) have been in the handover stage for more than 90 days. Some of the reasons for this include the time taken, or required, to verify the cost of the project, collate and check information about the assets, and resolve any quality issues.

4.20   Because the rate of handing projects over is slower than planned, the Council has a large balance of "work in progress". The Council is not able to accurately classify these assets in its financial statements as "completed assets", "assets under construction", and "operating expenditure". As a result, the Council has not depreciated completed assets. The Council has also not been able to revalue damaged assets. These two reasons contributed to us issuing a qualified audit report[12] for the Council for 2015.[13] The Council is also unable to get insurance and valuations for assets in the "work in progress" balance.

4.21   Improvements to the handover of assets need to continue so SCIRT can clear the backlog, targets can be met, and the Council can manage its assets effectively and responsibly.

Identifying, sharing, and applying lessons

SCIRT is identifying, sharing, and applying many lessons about managing and delivering a horizontal infrastructure rebuild. The public entities need to continue actively and systematically identifying, recording, and sharing their own lessons from SCIRT and the Alliance approach. The public entities also need to manage the risk that their own lessons might be lost when staff leave or organisations change.

Identifying lessons

4.22   SCIRT is identifying lessons, and the public entities recognise the value of learning and are also identifying lessons. SCIRT maintains a register of innovations and initiatives. It has used this register to promote, monitor, and report innovations from early ideas to working results. The register allows lessons from ideas

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12   See our audit blog "The Kiwi guide to audit reports" at http://blog.oag.govt.nz/ for more information.

13   Christchurch City Council (2015), *Annual Report 2015*, Christchurch, page 152.

suggested by staff and delivery teams to be recorded systematically and continuously identified. As at August 2014, SCIRT had recorded 550 innovations, compared with 161 innovations at February 2013. We refer to the value of these initiatives in paragraph 4.36.

4.23 Delivery teams also identify practical lessons and share them within SCIRT, including with other delivery teams (see paragraph 4.27). SCIRT recently changed some of its key performance indicators to encourage delivery teams to identify and share lessons and innovations.

4.24 The public entities are identifying their own lessons, and are starting to systematically record them. For example, the Horizontal Infrastructure Team in CERA started a lessons register in late 2014.[14] The lessons were incorporated into the CERA Learning and Legacy project in 2015. These lessons were from SCIRT and the wider horizontal infrastructure programme, including lessons about managing and governing the horizontal infrastructure programme.

4.25 Staff from the public entities and SCIRT held a workshop in October 2015 to prepare a plan for managing the transfer of assets back to NZTA and the Council (see paragraph 4.11). The Transition Implementation Plan developed subsequently includes workstreams on identifying and sharing lessons.

4.26 The public entities need to continue their work in actively and systematically identifying and recording their own lessons. The public entities also need to manage the risk that their own lessons might be lost when staff leave or organisations change. We encourage the public entities to continue with their recent projects to better identify lessons.

Some lessons are being shared

4.27 SCIRT shares lessons through formal and informal channels. Within SCIRT, lessons are distributed through newsletters and at regular meetings with delivery teams. For example, SCIRT shares lessons about how to avoid accidentally damaging utilities (such as underground internet cables). We understand that lessons are also being shared within the delivery teams' organisations, beyond staff in Christchurch.

4.28 SCIRT has a learning legacy project to share lessons with a wider audience. In particular, the project identifies and shares lessons learned from setting up and managing an alliance to respond to a natural disaster. SCIRT has an agreement with the University of Canterbury Quake Centre to help deliver the learning legacy project.

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14 This register will now be updated by staff responsible for horizontal infrastructure in the Department of the Prime Minister and Cabinet.

4.29   A SCIRT learning legacy website is planned, and it will be available to the public and other interested parties. Its content will be organised by themes that reflect the different areas of innovation and work that SCIRT has done.

4.30   SCIRT has shared its experiences and practices with the Council. After a request from the Council, SCIRT hosted a workshop in February 2016 for elected representatives and senior managers from the Council. The purpose of the workshop was to increase the Council's understanding of what SCIRT does, and demonstrate how some of SCIRT's practices can help the Council in the future.

4.31   In 2013, an internationally recognised civil engineering professional body, the Institution of Civil Engineers, awarded SCIRT the Brunel Medal. The Institution of Civil Engineers awards the Brunel Medal for excellence in civil engineering. In connection with this award, Duncan Gibb, former Executive General Manager of SCIRT, has travelled internationally to speak about his lessons and experiences from SCIRT.

4.32   The public entities have been sharing lessons, but not in a planned or routine way. This is important, because the public entities have identified some of their own lessons as well as those from SCIRT. For example, the Council has shared lessons at conferences and through articles in publications, such as the Institute of Professional Engineers New Zealand's *Engineering Insight* magazine. CERA shares lessons within its organisation, with other public entities, and with international organisations such as the United Nations and the World Bank.

4.33   The public entities do not currently have a repository (such as a website or publication) where their lessons can be accessed by others. However, CERA and the Council are planning to prepare a website, or websites, about lessons on the recovery from the Canterbury earthquakes.

4.34   As mentioned in paragraph 4.25, the public entities have workstreams on identifying and sharing lessons from the horizontal infrastructure rebuild. The public entities also intend, once they complete the horizontal infrastructure rebuild, to share lessons publicly from their various reviews of the horizontal infrastructure rebuild.

4.35   In our view, something to consider and put in place at the start (after the emergency phase) of a major programme like this is a regular "lessons learned" process, leading to continuous improvement, which benefits other programmes. We encourage the public entities and SCIRT to continue, and build on, their sharing practices, within the programme and with a wider audience.

Some lessons are being applied

4.36   SCIRT and its delivery teams have been applying lessons. Interviewees described SCIRT as a "learning organisation" that continually applies lessons to its work. As at August 2014, SCIRT's application of innovations from the value register has resulted in an estimated saving of $37.4 million. Examples include improving the process for handing assets over to the Council and NZTA, and stockpiling and drying hydro-excavation material to limit the costs of disposal.

4.37   The public entities have applied some lessons from SCIRT. For example:

- The Council is going to change its asset management practices for designing and delivering assets. The Council has also introduced changes in its approach to horizontal infrastructure (for example, building a vacuum sewer system).

- NZTA has shared SCIRT's health and safety practices with its suppliers, who have voluntarily adopted them. NZTA recognises the benefits of the collaborative client-led approach of the rebuild and is fostering more collaboration in its internal work and its work with the sector.

- CERA is applying its improved understanding of the appropriateness of design solutions and the level of financial management required, based on issues identified in earlier and similar work.

4.38   NZTA and the Council have seconded some staff to work at SCIRT. Most of these staff have now returned to their home organisations, where they are using the experience and knowledge they gained at SCIRT. This is important for the Council and NZTA because they will have staff who are knowledgeable and skilled in applying asset management tools, systems, and practices. SCIRT also benefited from having staff seconded from NZTA and the Council because of their asset and network knowledge.

5

Effect of decisions about levels of service and funding

5.1   In this Part, we discuss:

- levels of service;
- changes to funding arrangements; and
- effect of delays in resolving disagreements about the use of available funding.

Summary

5.2   The three main factors that influence decision-making for asset management are:

- the condition of the pipe or road;
- the desired level of service (the performance standard an organisation intends the asset to deliver to its customers)[15] that the assets should deliver in the future; and
- the funding available.

5.3   The three factors are interrelated. For example, if the condition of a pipe is poor and there is limited funding available, the standard of the repair may get the pipe functioning again, but not to the desired level of service.

5.4   In our 2013 report, we recommended that the public entities agree on the levels of service that the rebuild would deliver, confirm the funding arrangements, and consider a second independent review of the Infrastructure Recovery Technical Standards and Guidelines. As a result of our recommendation in 2013, and improvements in SCIRT's governance practices, we expected the levels of service and funding arrangements to be clear and agreed. We also expected the public entities to decide these matters jointly, in a collaborative and timely way.

5.5   The public entities faced challenges in deciding the appropriate funding and levels of services for the horizontal infrastructure. In disaster recovery work, getting the balance right between competing interests is difficult. For example, there may be tensions between:[16]

- local decision-making and central decision-making; and
- investing now to save later and the amount of funding available.

5.6   The levels of service are now agreed, the funding arrangements are confirmed, and a second independent review of the Infrastructure Recovery Technical Standards and Guidelines has been carried out. The funding arrangements, however, took up to 19 months to confirm, creating funding uncertainty for about 30 wastewater and stormwater projects for more than eight months. The funding arrangements were confirmed in late 2015 and, as at March 2016, all projects

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15   National Asset Management Steering Group (2011), *International Infrastructure Management Manual*, 4th edition, section 2, page 18.

16   E McNaughton, J Wills, D Lallemant (2015), *Leading in Disaster Recovery: a companion through the chaos*, New Zealand Red Cross, pages 4-5.

decided as eligible for funding under the Cost Sharing Agreement were scheduled to proceed.

Agreed levels of service

The public entities have agreed on the levels of service for pipes and roads. As a result SCIRT now designs stormwater and wastewater pipes to two standards.

5.7 SCIRT now has a clearer understanding of the standard it should deliver its projects to, and the levels of service for pipes and roads. This results from:

- the agreement reached by the public entities about the levels of service that pipes and roads should meet;

- revised design guidelines;

- the changes made to the Infrastructure Recovery Technical Standards and Guidelines because of the second independent review; and

- the directions SCIRT now receives from the Infrastructure Programme Co-ordination Team (and the Council for wastewater and stormwater pipes) about applying the design guidelines to projects.

5.8 The public entities shifted from a "damage repair" approach (all damaged assets are repaired) to a "network performance approach" (repairs are prioritised to improve the overall functionality and serviceability of the network) in 2014 for water supply, wastewater, and stormwater pipes. This means that some earthquake-damaged pipes might not be repaired because the damage does not meet a threshold for repair under the network performance approach.

5.9 The public entities shifted away from the original goal of restoring the horizontal infrastructure to the levels of service delivered before the earthquakes. The Council describes this shift in its Infrastructure Strategy 2015-2045:

SCIRT's scope was to originally restore pre-earthquake levels of service. However, due to the budget reductions ... the SCIRT scope is now focused on repairing earthquake damage.

This is subtly different from the original scope and means that in situations where a repair is warranted rather than renewal, only the earthquake damage will be repaired, not the level of service deficiency. Where full renewal is required it will be delivered to meet the current design and construction standards.

5.10 SCIRT uses design guidelines agreed by the public entities in 2014 to assess damaged assets and design each project. Changes were made to the design guidelines to reflect the move to a network performance approach and funding changes. Both roading and water supply assets have agreed design guidelines.

5.11   In 2014, CERA and the Council agreed on an approach to the design guidelines for wastewater and stormwater pipes. SCIRT now designs these projects to two standards in an effort to balance the inherent tensions between investing now to save later and the funding available under the Cost Sharing Agreement. The Council decides the standard to which particular wastewater and stormwater pipes are to be repaired. It is also responsible for any funding difference between the standard eligible for funding under the Cost Sharing Agreement and its preferred standard. This gives the Council the opportunity to choose the best solution, taking into consideration both the desired level of service performance and the available funding.

5.12   The decision to design to two standards was made in 2014 as part of the optimisation exercise (see paragraph 5.16). Because of this decision, several projects needed to be redesigned and some needed more design work. Despite the extra design time and costs, overall project costs did not necessarily increase.

Changes to funding arrangements

The public entities made changes to funding estimates over the last three years. These changes were partly due to the uncertainties inherent in disaster recovery work. Funding has now been confirmed.

5.13   Funding arrangements were finally confirmed in late 2015. The public entities have made changes to funding estimates since our 2013 report. Generally, these changes are because of the uncertainties inherent in disaster recovery work, and the public entities revisiting decisions about the work programme and estimated costs as better information became available.

5.14   The funding arrangements were revisited over time:

- In 2013, the public entities signed the Cost Sharing Agreement (June 2013) and the Memorandum of Understanding (September 2013) in which the Crown estimated that it would contribute $1.8 billion for rebuilding the horizontal infrastructure. The Council estimated that it would contribute $1.14 billion. Most, but not all, horizontal infrastructure repair work funded under the Cost Sharing Agreement is to be carried out by SCIRT.

- In April 2014, Cabinet decided to take a network performance approach to levels of service (thereby removing the eligibility of some repair work from under the Cost Sharing Agreement) and noted that CERA would "continue to pay all eligible and valid invoices, which from 1 April 2014 may include components of renewals [replacement of old pipes], on the basis of 60 per cent Crown financial assistance" for repairing water infrastructure.

- In April 2015, the Independent Assessor reported that the estimated cost of horizontal infrastructure repair work to be done under the Cost Sharing Agreement would be $2.899 billion (approximately $41 million less than the total expected by that Agreement in 2013).

- On 23 November 2015, Cabinet decided that the Crown's revised financial contribution would be $1.689 billion ($111 million less than estimated in 2013), and confirmed that "the general Crown policy for government financial assistance in recovery is not to fund renewals (i.e. not fund the depreciated portion of assets), and the maximum Crown contribution of $1.800 billion for the Council's horizontal infrastructure recovery costs was set on this basis."

5.15 Figure 9 shows the funding estimates, and each public entity's estimated contribution, from 2013 to 2015 (where available).

Figure 9
Horizontal infrastructure funding estimates from 2013 to 2015

	Cost Sharing Agreement and Memorandum of Understanding (2013)	Independent Assessor's report (April 2015)^	Cabinet decision (November 2015)
CERA	$958.5 million		$912.0 million**
NZTA	$634.8 million		$570.0 million**
DIA†	$206.6 million		$207.0 million**
Crown total	**$1,800 million**		**$1,689 million****
Council	$1,140 million*		$1,016 million
Combined total	**$2,940 million**	**$2,899 million**	**$2,705 million**

^ The Independent Assessor's report did not divide out the Crown and Council shares.

† Department of Internal Affairs, through the Ministry of Civil Defence and Emergency Management.

* From the Memorandum of Understanding (September 2013) to the Cost Sharing Agreement (June 2013).

** From Cabinet paper (Horizontal Infrastructure funding, 2015, paragraph 12) – the figures were rounded.

5.16 From April to July 2014, the public entities, with help from SCIRT, also carried out an "optimisation exercise" to reprioritise projects within the programme's remaining funds. The optimisation exercise was necessary because work planned under the Cost Sharing Agreement exceeded the available funding. The resulting report set out a proposal for allocating funding and prioritising work, and identified that changes in contributions from the public entities might be necessary. For example, the Council and CERA might have needed to contribute more funding for water infrastructure repairs. The Horizontal Infrastructure Governance Group used the results from the optimisation exercise to reprioritise projects.

Effect of delays in resolving disagreements about the use of available funding

Funding uncertainty and associated delays can be costly in an alliance. About 30 SCIRT projects ready for construction were put on hold for more than eight months as a result of some funding disagreements. Despite the uncertainty, all projects decided as eligible for funding under the Cost Sharing Agreement are now scheduled to proceed. The Council is responsible for any repairs to earthquake-damaged assets not carried out by SCIRT or not covered by the Cost Sharing Agreement.

5.17   The uncertainties inherent in disaster recovery work can lead to inefficiencies. Public entities can manage this through timely information sharing, collaboration, and prompt resolution of disagreements.

5.18   The public entities worked well together to resolve some of the funding issues. For example, CERA and the Council agreed to some minor financial adjustments for some early projects because they were not eligible for funding under the Cost Sharing Agreement. The Council and NZTA resolved issues raised in the Independent Assessor's report (April 2015) about repairs to roads, bridges, and retaining walls.

5.19   However, some of the disagreements could have been dealt with better. For example, CERA and the Council disagreed about how to fund wastewater and stormwater pipe repairs, and this led to delays (see paragraphs 5.20-5.24).

Funding for water infrastructure repairs

5.20   CERA and the Council disagreed about the implications of the Cabinet decision in April 2014 about funding of "components of renewals" (see paragraph 5.14), and the optimisation exercise in July 2014 (see paragraph 5.16). Communication from CERA to the Council about the Cabinet decision was poor. For example, the Council had to request a copy of the Cabinet decision under the Official Information Act 1982. CERA and the Council also had different interpretations of what the Cabinet decision would mean in practice, and the extent of these differences was not fully understood until early 2015.

5.21   A report in June 2015 said that this disagreement meant that 30 SCIRT projects (totalling $147.3 million) had yet to have funding confirmed, so construction could not begin. The report also noted that, because of the delays, it might not be possible to start some of the projects in SCIRT's work programme because they might not be completed by December 2016.

5.22   Prompt resolution of disagreements is important in the effective and efficient operation of an alliance. The Minister for Canterbury Earthquake Recovery and the Mayor of Christchurch are responsible, under the Cost Sharing Agreement, for issuing a joint direction if there is a funding disagreement. The funding disagreement about water infrastructure was not escalated to the Minister and the Mayor until mid-2015. The poor communication, mainly from CERA to the Council, meant that this issue was not recognised and addressed earlier. Given that the disagreement had arisen from misunderstandings, it would have been beneficial if CERA and the Council had prepared a joint paper setting out their different views and some options for the Minister and the Mayor to consider. This might have enabled the Minister and the Mayor to resolve the disagreement.

5.23   Funding for water infrastructure repairs was settled through a Cabinet decision on 23 November 2015 and a memorandum from CERA and the Council to the Horizontal Infrastructure Governance Group on 20 January 2016. The $1.689 billion decided by Cabinet is less than the Crown contribution estimated under the Cost Sharing Agreement (2013). This reduces the total funding under the Cost Sharing Agreement to less than estimated in the Independent Assessor's report (2015). The Council will also contribute less under the Cost Sharing Agreement. These reductions are partly due to inflation being lower than expected. All projects decided as eligible for funding under the Cost Sharing Agreement are now scheduled to proceed. The Council is responsible for any repairs to earthquake-damaged assets not carried out by SCIRT or not covered by the Cost Sharing Agreement.

5.24   If timely, open, and clear information was made available, delays could have been avoided. Bearing in mind the challenges for decision-making during disaster recovery, this funding disagreement could have been managed better if:

- CERA had advised the Council promptly of Cabinet's decision in April 2014 about funding for renewal of pipes and how CERA intended to implement the decision;
- the disagreement had been escalated more quickly to the Minister and the Mayor; and
- CERA and the Council had prepared a joint paper for the Minister and the Mayor, with a view to them giving a direction to the public entities under the Cost Sharing Agreement.

Long-term implications

5.25   Christchurch will have the agreed levels of service for water and road networks when the SCIRT programme finishes. Decisions about funding and levels of service are, however, likely to have long-term implications for the Council. Horizontal infrastructure with earthquake damage that is not repaired because it does not meet the threshold for repairs under the network performance approach, and is not eligible under the Cost Sharing Agreement, is likely to require more regular maintenance or earlier replacement. For example, SCIRT estimated that, after the horizontal infrastructure programme ends, the average remaining life of the wastewater network will be 4.5 years less than before the earthquakes.

5.26   The Council expects that it will need to increase its rate of replacing or repairing pipes and roads for the next 20-30 years. The Council's Long-Term Plan 2015-2025 sets out its estimates for the cost of future repair work, and notes the challenges in forming those estimates. In our audit of the Council's Long-Term Plan 2015-2025, we concluded that it had been prepared using the best information available, but relied on some significant assumptions, and that the Council rightly recognised that a high level of uncertainty remains about the estimated cost of repairs to all of the Council's assets.[17] At the time of writing this report, the Council was in the process of amending its 2015-2025 Long-Term Plan.

17   Christchurch City Council, *Christchurch City Council's Long-Term Plan 2015-2025*, Christchurch (2015), pages13-14.

Looking to the future

6.1   In this Part, we discuss:

- what the Council, CERA, and NZTA need to act on now; and

- what public entities should keep in mind for future major infrastructure work and disaster recovery.

Summary

6.2   There is work that the public entities need to do now to realise the benefits of the work carried out by SCIRT for Christchurch, for responses to future disasters, and for major infrastructure programmes.

6.3   We also share some considerations from our audits about SCIRT for all public entities to keep in mind for the future.

Immediate priorities for Christchurch

The public entities and SCIRT need to sustain recent momentum in preparing for the transition from SCIRT back to the public entities, to realise the benefits of SCIRT's work for the people of Christchurch, and for broader application.

6.4   The Horizontal Infrastructure Governance Group, Infrastructure Programme Transition Group, and SCIRT Board need to work with the Council and SCIRT to support them in:

- implementing the Transition Implementation Plan, including the transfer of information from SCIRT to the Council; and

- improving the timeliness of the handover of assets to the Council.

6.5   This should include, for example, ensuring that the Council and SCIRT have access to the right resources and expertise at the right time to carry out the Transition Implementation Plan (see paragraphs 4.8-4.17), and to actively manage the risks associated with the transition.

6.6   If the Council transfers the information from SCIRT proficiently, then it will be in a sound position to realise the benefits of the information collected by SCIRT. The Council could use this information to develop systems, practices, and policies to complete repairs to the horizontal infrastructure, and to manage it and the higher costs, over the next 20-30 years.

6.7   The public entities need to continue actively and systematically identifying, recording, and sharing their lessons from the Alliance approach. In our view, waiting until the "end" poses significant risks because of staff turnover and changes to organisations. Lessons identified and shared during the repair work can be examined at the end to see whether they remain valid, and whether value

for money was achieved from the Alliance. SCIRT and the public entities' work under the Transition Implementation Plan provides an opportunity to do this. However, failure to identify and record lessons now increases the risk that the benefits of the Alliance and SCIRT work will not be fully realised.

6.8   We suggest that the public entities look at:

- how they will manage continuity of membership at meetings during the remaining stages of the SCIRT work programme (see paragraph 3.24);

- whether they need to strengthen the audit framework to address concerns about financial reporting and how they decide risk levels (see paragraph 3.48); and

- whether reporting on financial information to the Horizontal Infrastructure Governance Group and the SCIRT Board needs to be changed (see paragraph 3.53).

6.9   We appreciate that, given the current stage of the programme, these three suggestions may not be a priority or essential for completing the SCIRT work programme. Nevertheless, we encourage entities to consider them.

Wider considerations for all public entities

Public entities can prepare themselves to perform well during major construction work or disaster recovery so that all parties can act in good faith to meet the immediate and future needs of the community.

6.10   We consider that some questions arising from our audits about SCIRT are useful reminders for all public entities about the complexities of programme governance and management, especially for the remaining stages of the Christchurch recovery. The questions are not intended to be exhaustive. Figure 10 lists some challenges and questions to consider when multiple parties are involved with major construction work or responding to natural disasters.

Figure 10
Challenges and questions to consider when multiple parties are involved with major construction work or responding to natural disasters

Challenges	Questions
Ensuring that roles and responsibilities are clear	• How will you ensure that governance roles and responsibilities are clear, and do not overlap with management roles and responsibilities?
	• If agreement cannot be reached, how and when can escalation procedures be initiated and by whom?
	• How will you organise funding so that public entities can adapt quickly and appropriately to programme changes (within their financial constraints and obligations)?
	• How will you jointly agree on the standards to which the work should be produced? (e.g. levels of services for assets.)
	• How will real and potential conflicts of interest be identified and managed? (If a conflict of interest exists, it does not necessarily mean that someone has done something wrong – the conflict just needs to be identified and managed carefully.)
	• How and when will agreements and memorandums of understanding be updated when circumstances change, and is it clear which documents apply in which circumstances?
Promoting collaboration	• How will you agree on a common purpose to drive the work programme? (e.g. SCIRT had "Better for rebuild".)
	• How will you encourage the right mind-set for participants? (e.g. SCIRT has six mind-sets or values for its work – best for communities, open to new ways and perspectives, collectively we are stronger, be generous with trust, zero harm, and developing our people.)
	• How will you encourage the right behaviours in participants? (e.g. SCIRT has six behaviours to encourage collaboration – listen actively, work together, strive for excellence, have honest conversations, have the courage to speak up, and lead by example.)
Managing relationships in good faith	• How will you inform the public about your work constructively, consistently, and in easily accessible language? (e.g. one spokesperson for programme with multiple parties.)
	• How will you ensure that all parties openly, promptly, and fairly engage each other when resolving issues? (e.g. where possible, joint advice should be given, and differing opinions should be fairly recorded so that decision-makers are well informed.)
	• How will you promptly inform all parties about decisions that affect them, including discussing how the decisions will be implemented (and the effect on each party) to reduce the risk of misunderstandings?

Challenges	Questions
Promoting continuous improvement	• What legacy will you leave? (e.g. one of SCIRT's objectives was to lift the capability of the sector and its workforce, including fostering innovation.) • How will you promote continuous improvement? (e.g. all parties should actively, systematically, and routinely identify, share, and apply lessons learned from the beginning of the work.) • How will you identify, share, and apply the lessons learned by others in similar situations?

Appendix
Progress in addressing our recommendations

Recommendations		What we found in 2013	What we found in 2016
1	We recommended that CERA, the Council, and NZTA: • change the governance framework to address ambiguity about roles and responsibilities, including the role and responsibilities of the independent chairperson.	In 2013, we found a lack of clarity about the role of the Client Governance Group, which has since been replaced by the Horizontal Infrastructure Governance Group, and the role of the independent chairperson. The roles of the Client Governance Group and SCIRT Board were blurred.	The public entities have improved the governance framework by clarifying roles and responsibilities. The governance framework now meets the needs of the SCIRT programme better. See paragraphs 3.6-3.18.
2	We recommended that CERA: • contribute more consistently to effective leadership and strategic direction for SCIRT.	In 2013, we found that CERA did not consistently send the same people to meetings of the SCIRT Board and the Client Governance Group. Some representatives from CERA did not have similar delegations to representatives from the Council and NZTA. We considered that CERA could not effectively co-ordinate and direct the rebuild if it did not get fully involved in governing SCIRT.	CERA is more involved and the public entities now provide more effective leadership and clearer strategic direction. See paragraphs 3.19-3.25.
3	We recommended that CERA, the Council, and NZTA: • use the governance arrangements to provide timely guidance to SCIRT on the priorities and direction of the rebuild.	Our 2013 report said that SCIRT's planning was ahead of other public entities working on the rebuild. We also said that the co-ordination between SCIRT and CERA was problematic. The lack of integration with the wider rebuild hindered SCIRT's ability to do the right thing, at the right time, and to the right standard.	Guidance is provided to SCIRT at a governance and operational level. However, the Horizontal Infrastructure Governance Group was hampered in giving timely direction to SCIRT because of the time taken by the public entities to make some decisions about the wider rebuild of Christchurch. See paragraphs 3.26-3.31.

	Recommendations	What we found in 2013	What we found in 2016
4	We recommended that CERA, the Council, and NZTA: • agree on the levels of service and quality of infrastructure that the rebuild will deliver, in conjunction with confirming funding arrangements, and consider a second independent review of the Infrastructure Recovery Technical Standards and Guidelines.	In 2013, the public entities formalised their cost-sharing arrangements for the rebuild, including for the horizontal infrastructure. However, our 2013 report noted that the public entities did not have a common understanding of the levels of service that were needed for SCIRT to deliver the best outcome.	The public entities have agreed on the levels of service for pipes and roads. The public entities made changes to funding estimates over the last three years. These changes were partly due to the uncertainties inherent in disaster recovery work. About 30 SCIRT projects ready for construction were put on hold for more than eight months because of some funding disagreements. Funding has now been confirmed, and all projects decided as eligible for funding are scheduled to proceed. See paragraphs 5.2-5.26.
5	We recommended that CERA, the Council, and NZTA: • use a coherent framework for measuring key aspects of SCIRT's performance that integrates project-level delivery team performance with alliance objectives and overall programme delivery, and is based on sound measures tested through SCIRT's internal auditing regime.	In 2013, we found that the public entities had not fully prepared a performance framework to monitor SCIRT's performance. For example, SCIRT and the public entities were still working on ways to define the value of SCIRT and to measure its performance.	The public entities use a performance framework to assess SCIRT's performance, which meets the needs of the programme. See paragraphs 3.32-3.41.

	Recommendations	What we found in 2013	What we found in 2016
6	We recommended that CERA, the Council, and NZTA: • ensure that their framework for auditing SCIRT provides them with adequate assurance that SCIRT is well managed and delivering value for money.	In 2013, we reported that the proposed audit framework had good coverage of important SCIRT systems and processes and that implementing the audit framework would provide a much-needed layer of assurance.	The public entities have an audit framework that provides them with adequate assurance. The audit framework is regularly updated, based on the risks to the horizontal infrastructure rebuild. See paragraphs 3.42-3.48.
7	We recommended that CERA, the Council, and NZTA: • in conjunction with strengthening performance measures, provide feedback to SCIRT to improve the analysis and information included in reports to the SCIRT Board and make these reports more useful.	In 2013, we found that the reporting to the Client Governance Group (now replaced by the Horizontal Infrastructure Governance Group) and the SCIRT Board was detailed and involved a lot of paper. The reporting did not help the governance bodies understand how well SCIRT was performing at a programme level.	The public entities provide feedback to SCIRT on reporting, and reporting has improved as a result. See paragraphs 3.49-3.53.

Publications by the Auditor-General

Other publications issued by the Auditor-General recently have been:

- Response to query about Housing New Zealand's procurement processes
- Reflections from our audits: *Governance and accountability*
- Draft annual plan 2016/17
- Local government: Results of the 2014/15 audits
- Department of Conservation: Prioritising and partnering to manage biodiversity – Progress in responding to the Auditor-General's recommendations
- Public sector accountability through raising concerns
- A review of public sector financial assets and how they are managed and governed
- Improving financial reporting in the public sector
- Principles for effectively co-governing natural resources
- Governance and accountability for three Christchurch rebuild projects
- Central government: Results of the 2014/15 audits
- Delivering scheduled services to patients – Progress in responding to the Auditor-General's recommendation
- Matters arising from the 2015-25 local authority long-term plans
- Earthquake Commission: Managing the Canterbury Home Repair Programme – follow-up audit
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