

Report 11 of 2019

Darlington Upgrade Project



Report of the Auditor-General

Report 11 of 2019

Darlington Upgrade Project

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2 December 2019

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President
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The Hon V A Tarzia MP
Speaker
House of Assembly
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Dear President and Speaker

**Report of the Auditor-General:
Report 11 of 2019 *Darlington Upgrade Project***

As required by the *Public Finance and Audit Act 1987*, I present to each of you Report 11 of 2019 *Darlington Upgrade Project*.

Under section 37(2) of the *Public Finance and Audit Act 1987*, I am required to:

- provide the Chief Executive Officer of the relevant public authority with a draft of my proposed report; and
- afford the Chief Executive Officer a sufficient opportunity to reply in writing.

I provided a draft of my proposed report to the Chief Executive of the Department of Planning, Transport and Infrastructure (DPTI) and his response is included as appendix 2 of this report.

Content of the Report

We examined whether the arrangements established to deliver the project on time, within budget and with intended benefits were effective.

The Darlington Upgrade Project will upgrade about 3.3 kilometres of the existing Main South Road. The project features a non-stop motorway between the Southern Expressway and north of Tonsley Boulevard and includes the construction of eight bridges and a lowered motorway. Once completed it will form part of the North-South Corridor and will be an important piece of State transport infrastructure.

The project is complex and requires effective management of significant project risks. It will also require significant expenditure of public monies, with a current budget of \$667 million. On 18 November 2019 the Commonwealth and SA Governments announced additional funding for the Darlington Upgrade Project of \$87.5 million. The Commonwealth Government is contributing \$70 million and the SA Government \$17.5 million. This increases total funding for the project from \$667 million to \$754.5 million. At the time of this announcement we were finalising this Report and therefore we have not amended the Report to reflect the impact of this additional funding. Accordingly, we have not reviewed any revision to the total expected cost and budget for the project.

We concluded that key elements of the Darlington Upgrade Project were not effectively managed as we identified deficiencies in important processes and functions. These included:

- numerous utility service relocation processes were deficient including; lack of documented analysis of DPTI's capacity to deliver works on time; the adequacy of contract provisions; lack of timely reporting; and gaps in monitoring works by service authorities and contractors
- key governance arrangements were not established or implemented timely, clearly defined and documented and there was limited oversight by governance committees
- fundamental contract management processes and documents were not established or established timely
- a significant contract variation was issued without documented analysis supporting this decision
- a risk management plan was not prepared timely and was still in draft
- deficiencies in the planning, monitoring and reporting on quality of works
- contingency management practices needed to provide better control and visibility over the use of contingency funds
- DPTI had yet to establish robust benefits realisation processes for the Darlington Upgrade Project.

Acknowledgements

The audit team for this report was Salv Bianco, Philip Rossi, Simon Altus and Grace Lum.

We appreciate the cooperation and assistance given by staff of the Department of Planning Transport and Infrastructure during the review.

Yours sincerely

A handwritten signature in black ink, appearing to read 'Richardson', with a long, sweeping underline.

Andrew Richardson
Auditor-General

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1 Executive summary

1.1 Introduction

We have completed a review of the Darlington Upgrade Project (DUP). We examined whether the arrangements established to deliver the project on time, within budget and with the intended benefits were effective.

The DUP will upgrade about 3.3 kilometres of the existing Main South Road. It features a non-stop motorway between the Southern Expressway and north of Tonsley Boulevard and includes the construction of eight bridges and a lowered motorway. Once completed it will form part of the North-South Corridor and will be an important piece of State transport infrastructure.

The DUP development started in 2009-10 and construction is well underway, with some parts of the motorway now operational. Recent project reporting indicates that the project is due to be completed by June 2020. The completed project is expected to address a number of transport issues including reduced average travel speeds, traffic congestion, unreliable travel times and the level of passenger vehicle accidents.

The project is complex and requires effective management of significant project risks. It will also require significant expenditure of public money, with a current budget of \$667 million.¹

Innovative construction methods were successfully used in the project, such as using self-propelled modular transporters to move large bridges constructed offsite to their final position. This is a significant achievement and we note that the learnings may be applied to future projects.

1.2 Conclusion

We concluded that key elements of the DUP were not effectively managed as we identified deficiencies in important processes and functions. They included:

- numerous utility service relocation processes that were deficient, including a lack of documented analysis of the Department of Planning, Transport and Infrastructure's (DPTI's) capacity to deliver works on time, the adequacy of contract provisions, a lack of timely reporting and gaps in monitoring works by service authorities and contractors
- key governance arrangements that were not established or implemented timely, were not clearly defined and documented and there was limited oversight by governance committees

¹ On 18 November 2019 the Commonwealth and SA Governments announced additional funding for the DUP of \$87.5 million to increase total funding for the project to \$754.5 million. This will increase the Commonwealth Government's contribution to \$603.6 million and the SA Government's contribution to \$150.9 million.

- fundamental contract management processes and documents that were not established or were not established timely
- a significant contract variation that was issued without documented analysis supporting this decision
- a risk management plan that was not prepared timely and was still in draft
- deficiencies in planning, monitoring and reporting on the quality of works
- contingency management practices that needed to provide better control and visibility over the use of contingency funds
- that DPTI had yet to establish robust benefits realisation processes for the DUP.

Some of these deficiencies, such as the management of service relocations, resulted in cost pressures and delays to the project while others increased the risk profile. For instance, the following issues significantly reduced the project contingency and exposed the project to significant financial risks in its early phases:

- awarding the principal design and construct contract in May 2016 before fully understanding the implications of proposed service relocations
- issuing a significant variation only a few days after awarding the principal design and construct contract.

Effective project management arrangements would have included early planning, identification and reporting of such issues to those charged with governance to ensure decisions were subject to robust analysis of risks, consequences and available options. We could not find any evidence that this occurred.

The DUP is a large and complex project that requires active and ongoing effective project management to ensure it is delivered on time, within budget and with the intended benefits.

The project is behind schedule due to a number of delays, including delays in completing service relocations. It has also experienced cost pressures with the project budget increasing by \$47 million to \$667 million and a forecast cost to complete of \$720 million.² Further, there was a significant construction failure in sections of the motorway and major financial claims have been issued by Gateway South (the principal construction contractor).

Consequently, DPTI faces a number of challenges in completing the project including:

- finalising outstanding claims issued by Gateway South for service relocations
- ensuring revetment wall failures are appropriately rectified and resolving related claims issued by Gateway South
- managing ongoing cost pressures.

DPTI has taken measures to address these challenges and identify areas for improvement including:

- reviewing project governance arrangements

² On 18 November 2019 the Commonwealth and SA Governments announced additional funding for the DUP of \$87.5 million to increase total funding for the project to \$754.5 million. The forecast cost to complete the project has not been amended in our Report to reflect the impact of this additional funding.

- engaging external experts to investigate the cause of the revetment wall failures
- conducting a detailed review of the project’s procurement and delivery processes.

We acknowledge that project governance arrangements, reporting and responsible officers changed throughout the project. In particular, we noted that a new DPTI Chief Executive commenced in late October 2018.

It is important that DPTI continues to focus on addressing the challenges to ensure the best project outcomes are achieved. DPTI’s review process will be a valuable opportunity for DPTI to reflect on its practices, evaluate the project learnings and implement improvements. For instance, this may include reviewing its approach in obtaining assurance over the quality of the design of large and complex infrastructure projects.

1.3 What we found

Area	Finding
Governance, reporting and accountability arrangements (Section 5)	<p>Key governance arrangements were not established or implemented timely, clearly defined and documented.</p> <p>Governance committees provided limited oversight for periods of the project.</p> <p>There was no detailed, comprehensive project reporting to senior management and governance committees for effective monitoring and critical evaluation of:</p> <ul style="list-style-type: none"> • project delivery performance • significant project risks and issues. <p>Project learnings were not identified and recorded timely and needed further development. There was also no mechanism for the DUP team to consider learnings from previous projects.</p>
Risk management (Section 6)	<p>The project’s risk management plan was still in draft.</p> <p>The project management reporting tool limits the number of risks that can be reported to senior management and governance committees.</p>
Contract management (Section 7)	<p>There was a lack of documented evidence to support the basis for issuing a significant contract variation six days after the principal construction contract was awarded.</p> <p>Key contract management processes and documents were not established or established timely including:</p> <ul style="list-style-type: none"> • contract management plans • monitoring and reporting on compliance with contract deliverables.

Area	Finding
	<p>No arrangements were established to ensure Gateway South maintained daily diary records and verify that they were accurate.</p> <p>DPTI made progress payments to Gateway South for works not yet undertaken and did not document its rationale for not following progress payment advice from the construction verifier.</p>
<p>Quality management (Section 8)</p>	<p>There was no documented quality management framework outlining how DPTI will ensure quality control is effective for the DUP.</p> <p>The DUP engineering and design management plan was not finalised and approved.</p> <p>There was no formal detailed review of reports provided by the construction verifier.</p> <p>Challenges faced by the construction verifier could result in conditional independent construction certificates being issued.</p> <p>There were weaknesses in the mechanisms to manage:</p> <ul style="list-style-type: none"> • specified points in the construction process (hold points) where the State can inspect works • works assessed as not complying with required specifications (non-conformances). <p>Processes and systems to manage defects were not established timely.</p>
<p>Utility service relocations (Section 9)</p>	<p>There was a lack of documented analysis to assess DPTI's ability to deliver service relocation works in line with contract milestone dates.</p> <p>There was a lack of timely reporting to DPTI executive on the status of service relocation delivery and emerging issues and risks.</p> <p>Contract provisions for service relocation works did not enable DPTI to effectively manage the performance of Gateway South and service authorities.</p> <p>There were deficiencies in contract management arrangements to monitor works by service authorities and a contractor.</p> <p>There was a lack of documented analysis to assess the impact of a major contract variation on DPTI service relocation works.</p>
<p>Financial management (Section 10)</p>	<p>There were shortcomings in contingency management practices to control and provide sufficient visibility over the use of contingency funds.</p> <p>The adequacy of the project budget and remaining contingency was not formally reviewed when significant, unexpected, cost-impacting events occurred.</p>

Area	Finding
	Senior management and those charged with governance needed to be provided with more detailed budget information to improve transparency and accountability for financial outcomes.
Benefits realisation (Section 11)	DPTI had yet to establish robust benefits realisation processes for the DUP to define, monitor, measure and report on the achievement of project outcomes.

1.4 What we recommended

We recommended that DPTI take the following actions.

Area	Recommendation
Governance, reporting and accountability arrangements	<p>Establish, document and approve key governance, reporting and accountability arrangements as early as possible in the project lifecycle.</p> <p>Establish protocols for two new governance committees to receive regular reporting on the DUP and consider how previous governance groups operated to determine:</p> <ul style="list-style-type: none"> • effective processes • gaps that need to be addressed. <p>Consider implementing detailed project management reports for the DUP and any future large and/or complex projects.</p> <p>To properly consider and apply project learnings:</p> <ul style="list-style-type: none"> • ensure processes to identify learnings are in place when projects start • establish a process to actively share learnings across DPTI projects and make this accessible to all staff.
Risk management	<p>Finalise the DUP risk management plan.</p> <p>For future projects, finalise and approve risk management plans as early as possible in the project lifecycle.</p> <p>Consider revising the project management reporting tool to allow more risks to be reported.</p>
Contract management	<p>Document and provide detailed analysis to decision-makers to support significant project delivery decisions, including contract variations.</p> <p>For future projects, ensure that contract management arrangements are documented before contracts are executed and include processes to monitor and report on compliance with key contract deliverables.</p>

Area	Recommendation
	<p>Implement a mechanism to ensure Gateway South prepares and maintains daily diary records and DPTI representatives review and sign them.</p> <p>Ensure contractors are properly paid for works performed and document the rationale for not reducing contractor payment claims where the construction verifier recommends a reduction.</p>
Quality management	<p>For future projects, develop and document a quality management framework before project delivery starts.</p> <p>Ensure that an engineering and design management plan is finalised and approved before design works start.</p> <p>Review reports from the construction verifier and document DPTI's response to identified key risks, issues and concerns that could impact project objectives and outcomes.</p> <p>Investigate challenges faced by the construction verifier in issuing conditional independent construction certificates.</p> <p>Establish processes to improve the management of:</p> <ul style="list-style-type: none"> • hold points (ie specified points where the State can inspect works) • works not complying with required specifications (non-conformances). <p>Ensure processes and systems to manage defects are established timely.</p>
Utility service relocations	<p>For significant project delivery decisions ensure that detailed analysis is documented and provided to decision-makers to enable DPTI to demonstrate that it has properly considered, assessed and evaluated key risks and issues.</p> <p>Ensure those responsible for overseeing projects are provided with sufficient information on the progress of service relocation works, emerging issues and risks.</p> <p>Establish robust mechanisms to manage the performance of contractors and service authorities to reduce exposure to delay and disruption claims.</p> <p>Implement robust contract management arrangements to monitor the progress of works and report on compliance with key contract deliverables.</p> <p>Ensure sufficient time is available to review the impact of contract variations on service relocation works.</p>

Area	Recommendation
Financial management	<p>To provide better control and visibility over the use of contingency funds DPTI should:</p> <ul style="list-style-type: none"> • align authorisations for using contingency funds with the current project governance and organisational structure • keep a log of drawdowns from the project contingency • produce detailed reporting on how contingency funds are allocated. <p>Formally review the adequacy of the project budget and remaining contingency as soon as significant cost pressures materialise and identify and implement strategies to address these pressures.</p> <p>Review what financial information senior management and those charged with governance need to fulfil their responsibilities. Consider providing them with more detailed financial reporting to improve transparency and accountability.</p>
Benefits realisation	<p>Benefits realisation management is needed throughout the project life cycle to achieve desired project outcomes. DPTI should:</p> <ul style="list-style-type: none"> • continue to develop and implement a benefits realisation plan for the DUP, and implement a benefits realisation plan from project inception for any future projects • define baselines and targets for all relevant measures • establish a benefits tracking tool to centrally track and monitor the progress of benefits throughout the project and beyond completion • ensure benefit owners agree and sign off on benefits • apply quality assurance processes to validate the integrity of benefits.

1.5 Response to our recommendations

The Chief Executive, DPTI responded to our detailed findings and recommendations. His responses to the specific findings are included in sections 5 to 11.

The Chief Executive, DPTI also provided a response to our proposed report to Parliament, which is included as appendix 2.

2 Background

2.1 The DUP is a section of the North-South Corridor

2.1.1 The North-South Corridor is an important transport route

The North-South Corridor is one of Adelaide's most important transport corridors. It is the major route for north and south bound traffic (including freight vehicles) and runs between Gawler and Old Noarlunga over 78 kilometres.

The current roadway was assessed as being unable to handle the projected number of vehicles that will need to use the road or the size of freight carriers travelling along it. To increase the capacity and efficient use of the roadway, the Commonwealth and SA Governments are funding a number of infrastructure projects to expand the route and create a dedicated non-stop North-South Corridor.³

2.1.2 The DUP is a relatively small part of the North-South Corridor

The DUP is a part of the North-South Corridor and involves upgrading about 3.3 kilometres of the existing Main South Road. Figure 2.1 shows the location of the DUP and that it is a relatively small part of the corridor.

2.1.3 Most of the corridor upgrade is complete or in progress

Many projects along the North-South Corridor are either finished or due to be completed in the near future. They cover 68 kilometres of the 78 kilometre corridor.⁴ The SA Government is currently finalising a business case for the remaining 10 kilometres.⁵

2.1.4 The corridor's final section will link the DUP to the River Torrens

The Commonwealth and SA Governments have jointly committed \$5.4 billion to complete the final section of the corridor that will link the DUP to the River Torrens.⁶ This final section is set to cost more than the combined total of the other projects and is expected to be the single biggest infrastructure project in South Australia's history.⁷

³ DPTI 2016, *North-South Corridor, Darlington Upgrade Project 2016, Project Assessment Report*, October, <https://dpti.sa.gov.au/infrastructure/nsc/darlington_upgrade_project/publications>, viewed 4 November 2019.

⁴ Infrastructure SA 2019, *20-year State Infrastructure Strategy Discussion Paper*, June, <<https://infrastructure.sa.gov.au/our-work/20-year-strategy/discussion-paper>>, viewed 4 November 2019.

⁵ *ibid.*

⁶ Marshall, S (Premier), Knoll, S (Minister for Transport, Infrastructure and Local Government) 2019, *\$5.4 billion on table to help finish North-South Corridor*, news release, 1 April.

⁷ *ibid.*

Figure 2.1: North-South Corridor



Source: DPTI.

2.2 Why the DUP is needed and what it will deliver

2.2.1 Transport problems the DUP is seeking to address

The section of Main South Road between Ayliffes Road and the South Expressway is subject to extremely high traffic volumes of about 76 000 vehicles per day.⁸ This is one of the highest traffic volumes of any road sections in South Australia and creates a number of transport efficiency and safety issues. The intersection of Main South Road and Sturt Road is the busiest at-grade⁹ intersection in South Australia, with about 105 000 vehicles per day passing through it.¹⁰ Four of the 10 busiest intersections in South Australia will be upgraded by the DUP.¹¹

Specific transport problems that the DUP is seeking to address include:

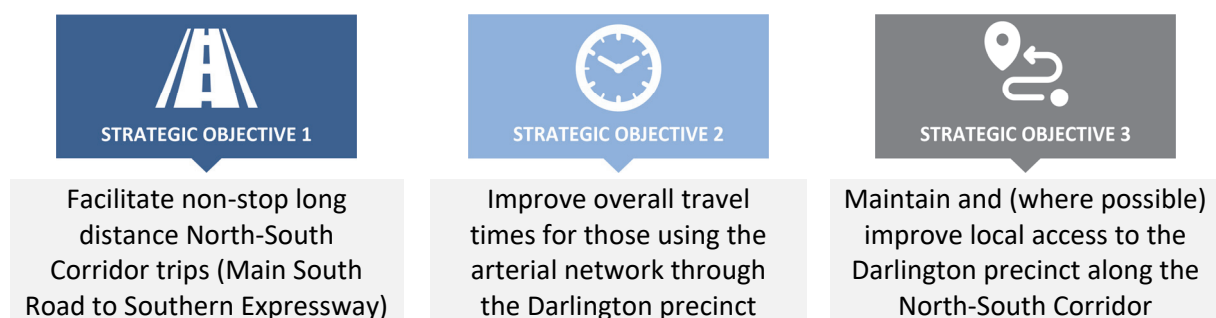
- well below average travel speeds that occur during the day on almost all sections of Main South Road through the Darlington precinct
- traffic congestion and unreliable travel times for vehicles on Main South Road and Sturt Road, which impacts businesses through increased costs and loss of productivity
- high rates of passenger vehicle crashes
- the poor walking and cycling environment that exists due to the lack of safe and convenient crossings at arterial roads.¹²

Section 2.2.3 discusses how the DUP expects to address these problems and the key features of the project.

2.2.2 Project objectives include improved travel times and local access

The three primary strategic objectives of the DUP are summarised in figure 2.2 in order of strategic priority.

Figure 2.2: DUP primary strategic objectives



Source: Developed from information in DPTI's Project Proposal Report for the DUP Delivery Phase.

⁸ DPTI 2015, *Project Proposal Report for North-South Corridor DUP Delivery Phase*.

⁹ A road is described as being at-grade when it is level with the surrounding land.

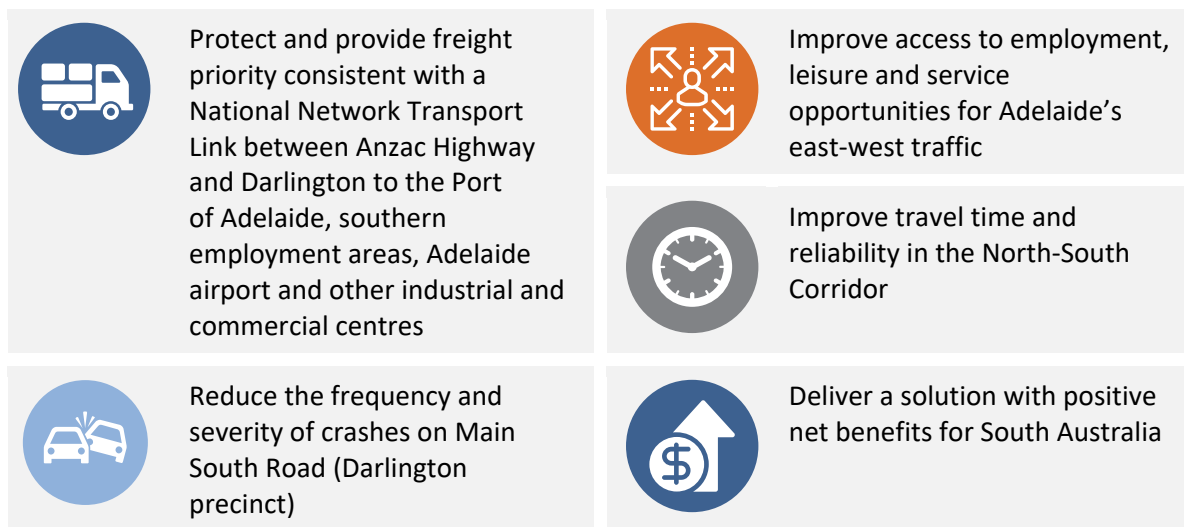
¹⁰ DPTI 2015, *Project Proposal Report for North-South Corridor DUP Delivery Phase*.

¹¹ *ibid.*

¹² *ibid.*

The following performance objectives were also developed for the DUP.

Figure 2.3: DUP performance objectives



Source: Developed from information in DPTI's Project Proposal Report for the DUP Delivery Phase.

2.2.3 Key features of the project

The DUP is expected to address the transport problems discussed in section 2.2.1 by providing grade separation¹³ at key intersections, allowing non-stop traffic flow for long distance trips to improve travel times and reliability.

The DUP will deliver an upgrade of about 3.3 kilometres of the existing Main South Road between the Southern Expressway and north of Tonsley Boulevard. It involves constructing eight bridges and a lowered motorway.

Key features of the project include:

- a non-stop motorway between the Southern Expressway and north of Tonsley Boulevard
- a non-stop motorway that passes underneath Flinders Drive, Sturt Road, Mimosa Terrace/Sutton Road, Ayliffes Road bridge and Tonsley Boulevard
- grade separation of the Main South Road/Ayliffes Road/Shepherds Hill Road intersection
- Main South Road (at-grade) surface roads along both sides of the lowered motorway to provide connections to Flinders Drive, Sturt Road, Ayliffes Road, Tonsley Boulevard and most local roads
- a full, free flow interchange at the Southern Expressway/Main South Road junction, with dedicated ramps providing direct access to and from the new motorway and Main South Road

¹³ A method of placing intersecting roads at different levels to stop conflicting traffic movements.

- a two-lane overpass for northbound traffic turning right to travel east onto Ayliffes Road.¹⁴

Figure 2.4 provides a visual representation of the project’s key features.

Figure 2.4: DUP overview map



Source: DPTI.

2.2.3.1 The project scope increased to extend the motorway by one kilometre

On 30 November 2015 the SA Government approved an increase to the DUP scope of works to extend the motorway by a further one kilometre to the north past Tonsley Boulevard. This increased the overall length of the upgrade from 2.3 kilometres to 3.3 kilometres. The Commonwealth and SA Governments jointly announced the extension on 20 December 2015, along with details of the preferred tenderer selected to design and construct the DUP.

DPTI explained its rationale for the scope increase to the Commonwealth Government in December 2015. This included that this section of South Road often experienced delays and poor travel time reliability and a high number of casualty crashes involving both commercial and private vehicles. DPTI considered the scope extension was an opportunity to further improve travel times and road safety and deliver benefits earlier.

DPTI advised that cost savings achieved in procuring the principal construction contractor provided the Commonwealth the opportunity to deliver these works earlier as part of the DUP.

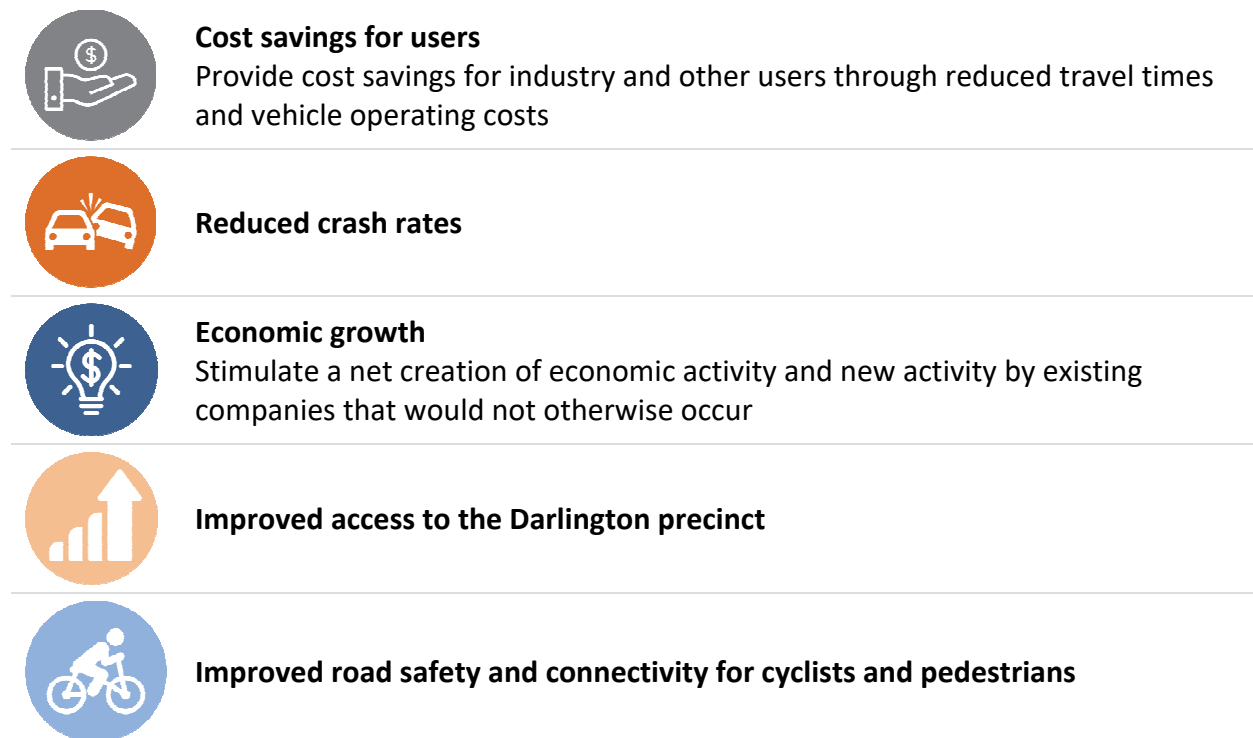
DPTI also determined that it could complete the increased scope of works within the existing \$620 million project budget as it could mitigate key project risks and contingencies within the initial scope of works.

¹⁴ DPTI 2015, *Project Proposal Report for North-South Corridor DUP Delivery Phase*.

2.2.4 Key benefits that the DUP is expected to provide

Figure 2.5 summarises the key benefits that the DUP is expected to provide. DPTI identified these benefits in the Project Proposal Report that it prepared for the Commonwealth Government in December 2015.

Figure 2.5: Key benefits that the DUP is expected to provide



Source: Developed from information in DPTI's Project Proposal Report for the DUP Delivery Phase.

The Project Proposal Report further explains that the scope extension to the north of Tonsley Boulevard is expected to provide additional benefits that include:

- increased savings for travel times and vehicle operating costs and improved safety
- reduced works required for North-South Corridor staging
- avoiding the need to close the motorway when it is extended as part of a future project.

2.3 Project timeline

The DUP is a large and complex project that is being completed over several years. Figure 2.6 summarises the key events over the period from when funding for the project was announced through to anticipated project completion.

Figure 2.6: Chronology of key events for the DUP



¹ The project is 80% funded by the Commonwealth and 20% by the SA Government (see section 2.7.1).

A detailed chronology of events in Appendix 1 provides further information.

2.4 The DUP interfaces with the Flinders Link Project

A significant part of the Flinders Link Project (FLP) overlays the DUP on Main South Road. The FLP will extend the existing Tonsley rail line by 650 metres to link the Flinders medical and education precincts to the passenger rail network. It includes an elevated single track

over Sturt Road, Laffers Triangle and Main South Road.¹⁵ Major construction works are in progress with the FLP forecast to be completed in October 2020, a few months after the DUP is expected to be completed.

Figure 2.7 shows the physical interface between the DUP motorway and the FLP rail line.

Figure 2.7: Artist's impression of the DUP with Flinders Link rail crossing over Main South Road



Source: DPTI.

Physical interfaces include the interaction of the Flinders Link rail bridge pier foundations and the DUP lowered motorway revetments on Main South Road.

DPTI advised us that delivering these integrated projects on the same site at the same time requires various safety, interface, program and consistency considerations. Given the significant interfaces between the two projects they are being managed by the same program lead to ensure the works are integrated effectively. To reduce the interface risks to both projects, the DUP's principal construction contractor was awarded a separate contract in May 2019 to construct the FLP.

2.5 Innovative methods used to construct the DUP

The DUP is a large and complex project that is being constructed using innovative methods.

Two bridges on Main South Road over the Southern Expressway were constructed using a method not used before in Australia on such a large scale.¹⁶ The two structures, which are each about 180 metres long and weigh about 3000 tonnes, were built offsite and then

¹⁵ DPTI, *Flinders Link Project*, <https://www.dpti.sa.gov.au/infrastructure/major_projects/flinders_link>, viewed 4 November 2019.

¹⁶ Mullighan, S (Minister for Transport and Infrastructure) 2017, *Major milestone for \$620 million Darlington Upgrade Project*, news release, 24 November.

transported and guided into their final positions using self-propelled modular transporters¹⁷ at a speed of about 100 metres per hour.¹⁸ The northern section of the Ayliffes Road bridge was constructed and installed using the same method. This installation method, shown in figure 2.8, significantly reduces traffic impacts and the need for multiple major road closures.¹⁹

Figure 2.8: DUP bridge on self-propelled modular transporters



Source: DPTI.

2.6 Project delivery status

2.6.1 The DUP is forecast to be completed in mid-2020

Construction works continue across all areas of the DUP site. Key traffic switches were recently completed to allow traffic to use the lowered motorway between the Southern Expressway and Ayliffes Road under temporary arrangements to accommodate ongoing lowered motorway construction activities.

¹⁷ Large platform vehicles similar to remote controlled trailers.
¹⁸ Mullighan, S (Minister for Transport and Infrastructure) 2017, *Major milestone for \$620 million Darlington Upgrade Project*, news release, 24 November.
¹⁹ *ibid.*

The Ayliffes Road flyover bridge that connects Main South Road northbound traffic to Ayliffes Road opened to traffic in September 2019. It was the final newly constructed bridge to become operational across the project.

Major construction works are continuing on the northern section of the lowered motorway.

The DUP is forecast to be completed in mid-2020. Section 2.6.2 discusses key works that still need to be completed.

2.6.2 Key activities remaining

A number of key activities remain ahead of project completion. They include:

- completing the lowered motorway, which remains critical to project staging. In the first quarter of 2020 revetment walls are scheduled to be completed and drainage and asphalt finalised
- completing the northern section of the lowered motorway so that it will be operational by the end of the first quarter of 2020 and to enable free flowing traffic to travel the full length of the DUP
- realigning Main South Road permanent traffic lanes to accommodate landscaping. This will continue through to early 2020
- final asphalt works across the entire project including the lowered motorway and surface roads. These works are scheduled to be completed in the first half of 2020
- testing, commissioning, operational readiness and handover processes.

2.7 Funding arrangements

2.7.1 The Commonwealth and SA Governments are funding the DUP

In May 2014 the Commonwealth and SA Governments committed funding of \$620 million to construct the DUP.²⁰ This subsequently increased to \$667 million to meet revised estimated project costs (explained in section 2.7.2).

The Commonwealth Government is funding 80% of the DUP under the National Partnership Agreement on Land Transport Infrastructure Projects (NPA), with the remaining costs funded by the SA Government.

2.7.2 Additional funding for cost pressures

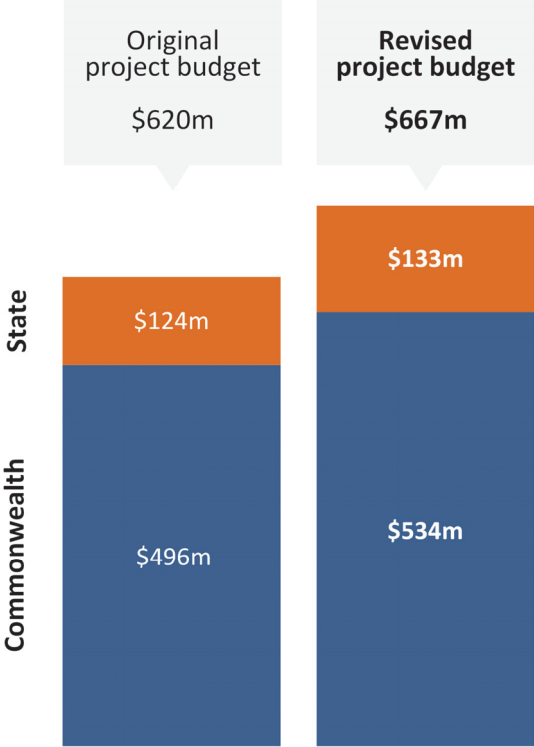
In October 2018 the SA Government approved the reallocation of \$47 million in savings from current and completed Commonwealth and SA Government funded projects to the DUP to address cost pressures (discussed in section 2.8.1). This reallocation of Commonwealth contributions was approved by the Commonwealth in July 2019. This increased the project's budget to \$667 million. The funding reallocation results in the Commonwealth providing an

²⁰ Mullighan, S (Minister for Transport and Infrastructure) 2014, *State and Commonwealth Partner in \$1.5bn North-South Corridor upgrade*, news release, 13 May.

additional \$37.6 million for the DUP and SA Government funding increasing by \$9.4 million.²¹

Figure 2.9 shows the amount of funding that each party has agreed to contribute towards the DUP.

Figure 2.9: Commonwealth and SA Government funding for the DUP



2.7.3 The Commonwealth Government’s role

The Commonwealth Department of Infrastructure, Transport, Cities and Regional Development (DITCRD) helps the Commonwealth Government and its Ministers to evaluate, plan and invest in infrastructure. It also administers the NPA.

The funding instrument issued by the Commonwealth sets out its approved maximum funding contribution to the DUP.

DPTI is required to submit information to DITCRD to enable it to assess the State’s compliance with the *National Transport Act 2014* (Cth) and the NPA. DPTI must also notify DITCRD when significant scope, time and cost variations occur.

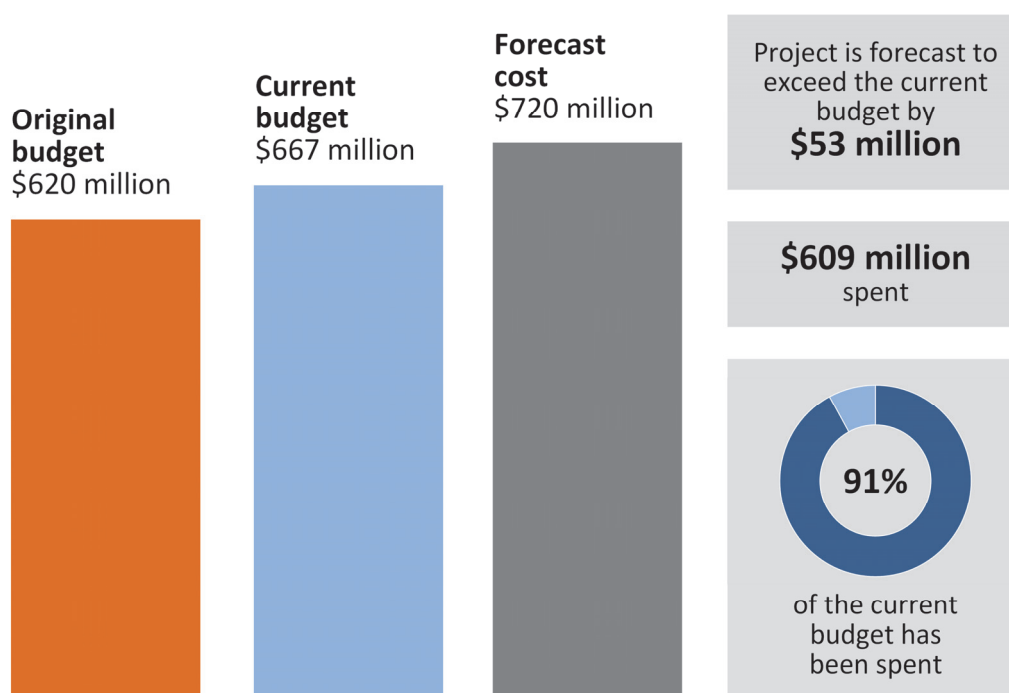
The Commonwealth makes payments to the State on the satisfactory achievement of agreed milestones.

2.8 Project budget and cost status

Figure 2.10 summarises the financial status of the DUP as at 30 September 2019.

²¹ On 18 November 2019 the Commonwealth and SA Governments announced additional funding for the DUP of \$87.5 million to increase funding to \$754.5 million. The project budget of \$667 million has not been amended in our Report to reflect the impact of this additional funding.

Figure 2.10: DUP financial status as at 30 September 2019²²



Source: Developed from information provided by DPTI.

As discussed in section 2.4, the DUP interfaces with Flinders Link. DUP costs include the design and construction work needed to accommodate Flinders Link.

2.8.1 The project budget increased by \$47 million to \$667 million

In mid-2018, DPTI identified that it could not complete the DUP within the original project budget of \$620 million. The estimated project cost was revised to \$667 million and, in October 2018, the project budget was increased by \$47 million to \$667 million.²³

Significant financial decisions to extend the motorway by one kilometre (discussed in section 2.2.3.1) and issue a significant contract variation (see section 7.3.1) consumed a large portion of the project contingency included in the original project budget. We note that when the decision was made to extend the motorway, DPTI anticipated that the DUP could still be completed within budget with the reduced project contingency.

DPTI advised us that after the motorway extension and significant contract variation decisions, the remaining project contingency was found to be insufficient to cover risks arising in the construction phase. DPTI attributed the additional costs mainly to service relocation delays, which in turn led to commercial claims by Gateway South (see section 2.12), as well as changes to the Tonsley bridge to provide better connectivity.

²² On 18 November 2019 the Commonwealth and SA Governments announced additional funding for the DUP of \$87.5 million to increase total funding for the project to \$754.5 million. The forecast cost to complete the project of \$720 million and project budget of \$667 million have not been amended in our Report to reflect the impact of this additional funding.

²³ *ibid.*

2.8.2 The project is forecast to exceed the current budget by \$53 million

As at 30 September 2019, the forecast cost to complete the project was \$720 million. This is \$53 million more than the current budget, and \$100 million more than the original budget.

DPTI advised that the difference between the forecast and current budget is due mainly to revised and new unresolved commercial claims from Gateway South (see section 2.12.2).

The accuracy of this forecast is highly dependent on the outcome of the commercial claims, as costs may be lower, or higher if the worst-case scenario materialises.

2.8.3 Additional funding announced to complete the project

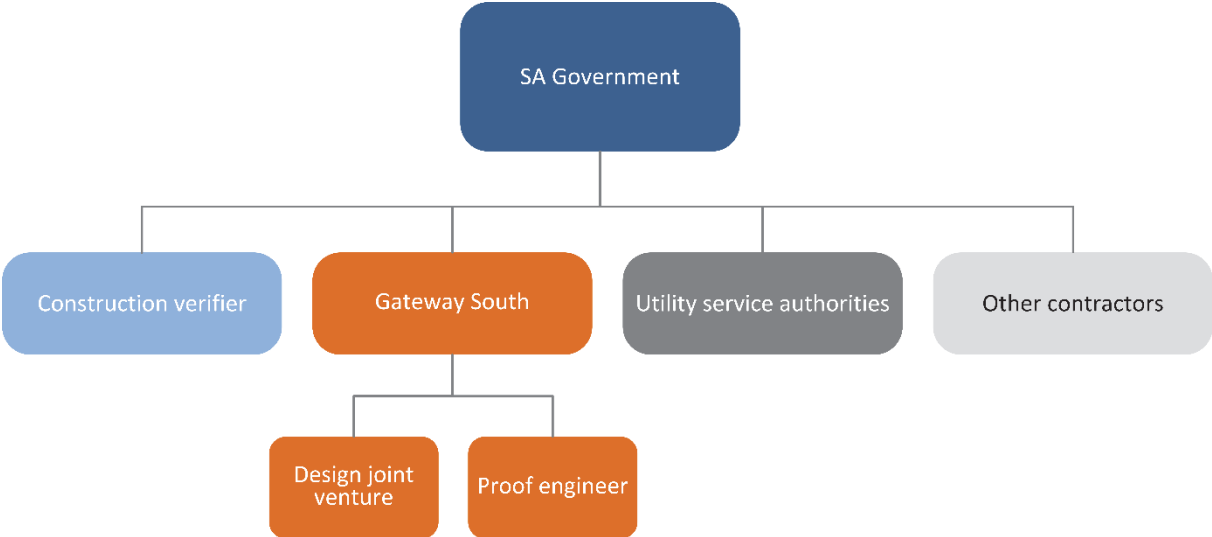
At the time of finalising this Report the project was fully funded up to the \$667 million project budget and the project contingency as at 30 September 2019 was fully committed.

On 18 November 2019 the Commonwealth and SA Governments announced additional funding for the DUP of \$87.5 million to complete the project. This increases the total funding for the project from \$667 million to \$754.5 million.

2.9 Key parties in designing and constructing the DUP

Figure 2.11 lists the key parties in designing and constructing the DUP.

Figure 2.11: Key parties involved in the DUP



Sections 2.9.1 to 2.9.4 explain the roles and responsibilities of these key parties.

2.9.1 Principal design and construct contractor

In May 2016 the contract to design and construct the DUP was awarded to Gateway South, a joint venture between Fulton Hogan and Laing O'Rourke.

Gateway South subcontracted a design joint venture of Jacobs, KBR and SMEC to perform its design services.

2.9.2 Proof engineer

Gateway South engaged Mott MacDonald as its proof engineer to independently verify the design of the works to be constructed. The design and construct contract requires Gateway South to use a proof engineer who is independent and not involved in designing the works. The role of the proof engineer is to separately validate the design solution including independent engineering calculations to ensure that it meets engineering standards and DPTI's specified requirements and design criteria. The contract requires Gateway South to ensure the proof engineer prepares a comprehensive report of its assessment and a certificate of compliance and provide these to DPTI with the final design.

2.9.3 Construction verifier

DPTI engaged GHD as an independent construction verifier for the DUP. Its main role is to review Gateway South's construction activities and verify that they comply with contract specifications and requirements. The construction verifier's purpose is to give DPTI assurance that construction works are delivered to required quality standards. The construction verifier is responsible for key activities, including:

- daily site surveillance and inspecting construction activities
- releasing construction hold points and witness points
- providing advice to DPTI on Gateway South's actions to address non-conformances
- reviewing Gateway South's monthly payment claims and advising DPTI if they are consistent with works undertaken
- providing signed construction verification certificates to DPTI for each package of completed works.

The construction verifier is not responsible for validating that the design of the works is adequate. Rather, it conducts site surveillance to verify that the works are constructed in line with Gateway South's design.

2.9.4 Utility service authorities and other contractors

A significant number of existing utility services along the DUP site needed to be relocated before major works started. DPTI, under its contract with Gateway South, was responsible for completing many of the service relocations.

DPTI entered into agreements with the utility service authorities²⁴ to help manage the works it had to deliver and engaged a number of other contractors to conduct service relocation works.

Section 9 provides further information about the utility service relocations.

²⁴ Government or private organisations responsible for the care and/or control of utility services. For example, SA Water, SA Power Networks and Telstra.

2.10 Principal design and construct contract

2.10.1 Key features of the contract

The DUP principal design and construct contract uses the GC21 conditions of contract. Key differences between a GC21 contract and other forms of construction contracts include:

- there is no superintendent role. In other forms of construction contracts a superintendent performs functions such as certifying progress payment values, assessing extension of time claims and issuing the certificate of practical completion
- they are a more collaborative form of contract that has provisions to increase cooperation and communication between the parties during project delivery
- the contractor must rectify all defects before a notice of completion is issued to them and there is no defect liability period.

Senior executives from DPTI and Gateway South, two from both parties, are responsible for discussing and resolving issues before they are referred to an independent expert.

The contract includes a detailed scope and technical requirements document that specifies the minimum requirements for Gateway South's work and the technical and performance requirements that it must meet.

2.10.2 A contract variation to transfer scope from the DUP to Flinders Link

As discussed in section 2.4 the DUP site overlaps the Flinders Link site. The interfaces between them resulted in works being performed on both projects concurrently. Gateway South was awarded contracts to design and construct both projects. The Flinders Link contract was executed on 17 May 2019 and on the same day the parties executed a deed to amend the DUP contract.

The DUP contract variation was entered into to address the interface between the works to be constructed by Gateway South on both projects.

The deed transfers certain works under the DUP contract to the Flinders Link contract to limit DPTI's liability for an extension of time under the DUP contract to 42 working days and any delay costs to \$5.2 million. It also states that the DUP contract price will be reduced by an amount agreed by the parties within 30 days of the deed being executed.

DPTI advised us that the parties have not yet agreed the reduced DUP contract price and that it has asked Gateway South to further substantiate costs. DPTI has also sought advice from a cost estimator to value the works to be transferred, which will be used to help finalise and implement the scope transfer.

Given the time that has elapsed since the deed was executed, we recommend that DPTI agree the reduction to the DUP contract price as soon as practical.

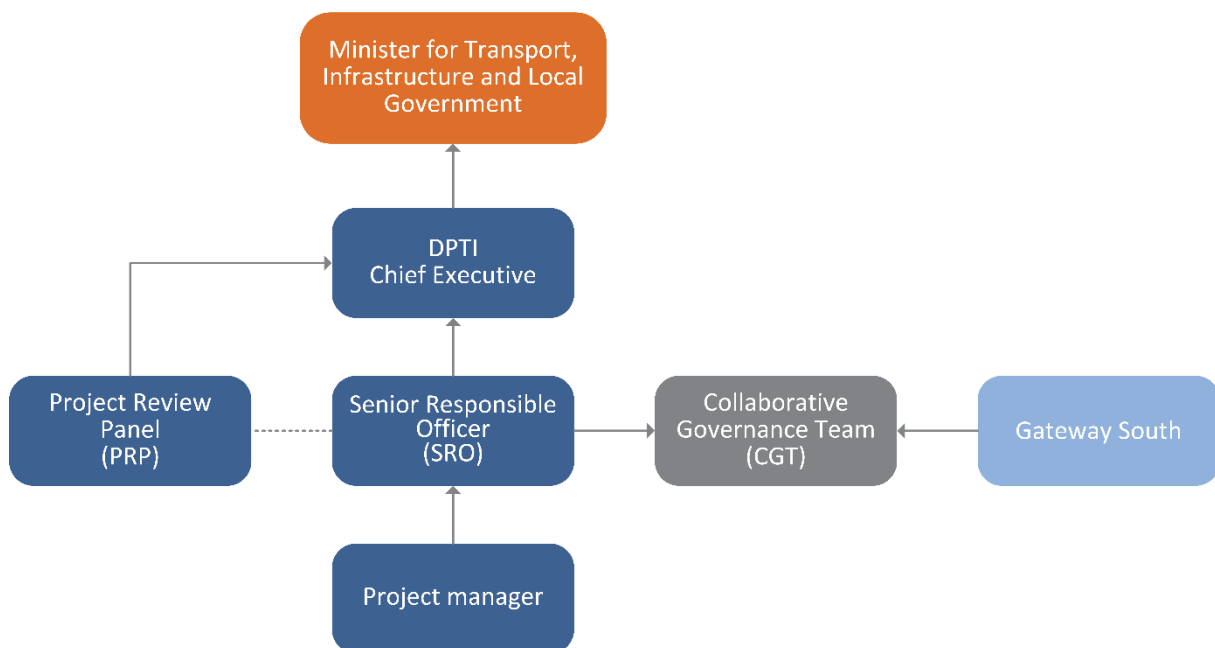
We also note that Gateway South has issued a \$2.6 million claim for costs related to the DUP works impacted by Flinders Link. This claim is still being assessed by DPTI.

2.11 Governance arrangements

Changes in DPTI governance structures resulted in several different governance groups being responsible for overseeing the DUP during the project delivery phase. These changes are described in section 5.1.3.

Figure 2.12 provides a high-level overview of the project governance arrangements at the time of our review.

Figure 2.12: Project governance arrangements



DPTI Chief Executive

The DPTI Chief Executive is responsible for the organisation and its outcomes, including the delivery of major infrastructure projects.

A new Chief Executive started during the project delivery phase in late October 2018.

Project Review Panel (PRP)

The PRP provides the DPTI Chief Executive with assurance that major projects are on time and within scope and budget, and helps the SRO in decision-making where required.

Senior Responsible Officer

The SRO is the executive/senior manager accountable and responsible for project outcomes. They report and are accountable to the DPTI Chief Executive. DPTI's project management framework explains that the SRO:

- is authorised to provide leadership, support and direction for the project, and direction to the project manager and project team
- approves key project documents, project scope, estimates and timelines
- monitors project financial status and performance
- reviews and approves all major change requests
- reviews the project at all major milestones
- ensures the project manager follows DPTI's project management framework
- helps the project manager resolve problems as needed.

There have been different SROs assigned to the DUP throughout its life.

Collaborative Governance Team (CGT)

The CGT comprises two senior representatives from DPTI and two senior representatives from Gateway South. Establishing a CGT is a general condition of GC21 contracts.

The CGT's terms of reference explain its purpose is to develop, implement and maintain project governance protocols and facilitate the development of collaborative strategies. The principal design and construct contract also explains that the CGT's role is to:

- provide guidance and leadership for the project
- provide a forum for regular and formal interaction between senior executives of DPTI and Gateway South
- monitor and review progress and performance.

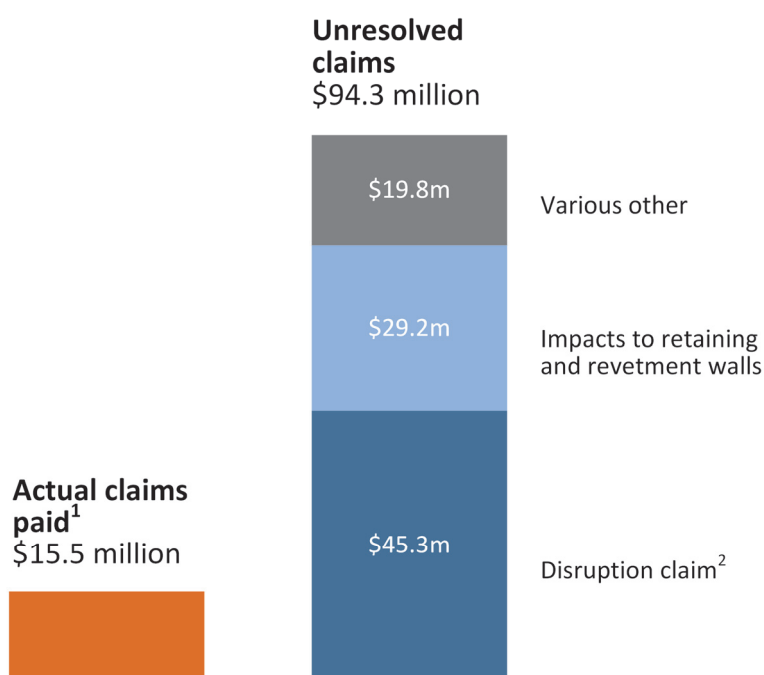
The CGT also provides a forum for the parties to resolve issues before they escalate.

2.12 Contractual claims issued by Gateway South

Gateway South has issued a number of extension of time, delay and disruption²⁵ claims. At the time our review the value of total paid and unresolved claims was \$109.8 million. Figure 2.13 summarises the claims that DPTI has paid and those that remain unresolved.

²⁵ A disruption (as distinct from a delay) is an event that disturbs, hinders or interrupts a contractor's normal working methods. Disruption claims relate to instances where contractors cannot conduct work activities as efficiently as possible or as planned due to disruption events that other parties are contractually responsible for.

Figure 2.13: Total paid and unresolved claims



¹ Claims paid to date relate to payments made for delay and disruption arising from late relocation of utility services.

² Represents \$49.3 million claimed less \$4 million paid.

Source: Audit analysis of DUP claim documents provided by DPTI.

Sections 2.12.1 and 2.12.2 explain the outcomes of claims that have been resolved and the nature and status of key unresolved claims that DPTI is still assessing.

2.12.1 DPTI has paid \$15.5 million in claims to date

Gateway South has issued three extension of time, delay and disruption claims for DPTI not completing utility service relocation works in line with contractual time frames. Section 9 provides further information about utility service relocations.

This section discusses two of the claims that have been resolved. Section 2.12.2 discusses the third claim that is yet to be resolved.

An independent expert determined Gateway South was entitled to \$5.3 million in delay costs and 55 days extension of time

In May 2017 Gateway South issued a claim related to delays in DPTI relocating a water main between Flinders Drive and Sturt Road. In June 2017 it issued an updated final claim for an extension of time of 60 days and delay costs of \$6.8 million.

In February 2018 the parties referred the matter to an independent expert in line with the contract's dispute resolution process. In June 2018 the independent expert determined that Gateway South was entitled to an extension of time of 55 days and delay costs of \$5.3 million, which DPTI paid in July 2018.

DPTI paid a further \$10.25 million and extended the contract completion date

In June 2017 Gateway South issued another claim for delays in DPTI decommissioning and relocating utility services. In November 2017 it issued an updated final claim for an extension of time of 129 days and delay costs of \$14.5 million. It noted that this amount would reduce to \$7.7 million if DPTI determined that it was entitled to its earlier claim that was still being assessed.

To avoid the cost of referring the claim to an independent expert, in October 2018 the parties entered into a settlement deed. Under its terms and conditions DPTI paid \$6.25 million to Gateway South and the contractual completion date was extended by 129 days from 10 August 2019 to 17 December 2019.

DPTI also paid Gateway South \$4 million of a \$49.3 million disruption claim for utility service relocation delays (see section 2.12.2).

2.12.2 Claims of \$94.3 million are yet to be resolved

Figure 2.13 shows that there are a number of significant extension of time, delay and disruption claims that are yet to be resolved. The total value of these claims is \$94.3 million.

This section discusses two main claims: the \$49.3 million disruption claim for utility service relocation delays and the \$29.2 million claim for retaining and revetment wall defects.

\$49.3 million disruption claim for utility service relocation delays

In October 2018 Gateway South issued a disruption claim for \$32.1 million. This amount included some estimates. On 13 September 2019 Gateway South issued an updated claim for \$49.3 million after finding that its initial claim was understated. It noted that \$1 million of the updated claim for increased design costs was still an estimate and stated it would provide further details of these costs.

Gateway South's claim states that it incurred significant additional costs to construct the DUP because DPTI did not complete utility service relocations by contracted dates and provide unrestricted site access. As a consequence, Gateway South claimed that it could not perform works in line with its planned construction methodology and had to work around DPTI's late utility service relocation works.

The parties have taken steps to resolve the claim in line with the contract's dispute resolution processes. This included senior executives from both parties meeting in July 2019 to try to resolve the claim.

In August 2019 the parties agreed to suspend the dispute resolution process so that they could continue to discuss and resolve the claim. DPTI advised us that its review of the claim is ongoing and that:

- DPTI paid \$4 million to Gateway South, which represents DPTI's assessment to date of Gateway South's entitlement based on information that it provided to support the claim

- the claim has been extensively reviewed by DPTI's DUP team and external advisers (including legal, commercial and programming experts)
- as the claim consists of a number of smaller claims and is extremely complex, it requires extensive analysis to properly assess it.

\$29.2 million claim for retaining and revetment wall defects

On 6 September 2019 Gateway South issued a \$29.2 million claim for costs of repair and rectification works, delay and disruption related to retaining and revetment wall defects. The amount claimed consists of:

- \$15.1 million for repair and rectification works
- \$10.8 million for delay costs
- \$3.3 million for disruption costs.

Gateway South has also claimed an extension of time of 227 days and if successful this will extend the contractual completion date to 31 July 2020.

Section 4 provides detailed information about the revetment wall defects and the status of works undertaken by Gateway South to repair and rectify three revetment walls on the eastern section of the lowered motorway.

The claim also includes deflection and damage to a piled retaining wall that is located on the eastern section of the lowered motorway next to the revetment wall that slumped. In December 2018, Gateway South detected movement to the retaining wall and found that it had experienced significant movement beyond its expected design parameters. In May 2019, after a period of extended rainfall, further movement was detected. Soil nails were installed as a temporary measure to provide additional restraint while further investigations were conducted and a permanent design solution developed.

DPTI advised that it is still assessing the claim and plans to complete its review using an updated report from an expert advisor that it engaged. The updated report is expected to be provided by the end of 2019.

2.13 Future challenges for the DUP

We noted a number of ongoing challenges facing the project, including:

- rectifying the revetment wall defects
- finalising outstanding claims relating to utility service relocations and the revetment wall slumps
- resolving cost pressures.

DPTI engaged external experts to investigate and provide independent advice on the revetment wall slumps. This included:

- investigating the cause of the slumps
- assessing if factors leading to the slumps may be present elsewhere in the DUP.

The external experts recommended further investigation to increase confidence in the integrity of the wall structures or determine if they need further strengthening.

DPTI needs to work diligently with external experts to be sure that satisfactory rectification works are carried out on the revetment wall slumps and, if required, other sections of the project.

Further, DPTI has engaged an expert to review the DUP's procurement and delivery processes. This will include analysing the processes and decisions taken, or not taken, across the DUP to identify any potential root causes of issues to date. Lessons learnt from the review will be communicated to DPTI to inform how processes could be improved and applied to future projects.

The learnings from the review, together with other learnings from the DUP, will need to be evaluated to identify where improvements can be made to existing policies, processes, systems and practices.

3 Audit mandate, objective and scope

3.1 Our mandate

The Auditor-General has authority to conduct this review under section 31(2) of the *Public Finance and Audit Act 1987*.

3.2 Our objective

We assessed the effectiveness of DPTI's management of the DUP, including the arrangements it had in place to manage the DUP to ensure it is delivered on time, within budget and with the intended benefits achieved.

3.3 What we reviewed

To conduct this review we assessed whether DPTI established:

- effective governance, reporting and accountability arrangements for the DUP
- a robust and structured process to identify and effectively manage project risks
- appropriate budgetary and financial management and reporting arrangements for the DUP
- robust contract management arrangements to ensure the State and Gateway South comply with key provisions of the contract and the project is delivered in line with these requirements
- processes to ensure works are completed to appropriate standards and specifications
- benefits realisation arrangements including processes to identify, measure, report and monitor the DUP's intended benefits.

We also obtained and provided background information on the revetment wall failures and actions taken to remediate them.

3.4 What we did not review

We did not review:

- project initiation processes
- the development of the project budget
- the procurement process for the design and construct contract
- the land acquisition process
- the cause of the revetment wall failure.

4 Revetment wall failure

4.1 Background

4.1.1 Revetment walls used to construct the DUP lowered motorway

A revetment wall is a construction technique that relies on the structural strength of the underlying soil mass in the slope to ensure that the slope is stable.²⁶ The high shear strength of unsaturated clay soils can provide enough support for slopes to stand permanently at steeper angles than would normally be possible, without the need for additional tension reinforcement such as soil nails.²⁷

The DUP has a total of one kilometre of revetment walls.²⁸ There are six revetment walls that are all located on the lowered motorway section. Three walls are on the eastern section of the lowered motorway and three walls are on the western section. Figure 4.1 provides the locations of the six revetment walls.

Figure 4.1 Location of DUP revetment walls

Eastern walls	Western walls	Location
RW 1102	RW 1106	Flinders Drive to Sturt Road
RW 1404	RW 1409	Sturt Road to the Sutton Road/Mimosa Terrace bridge
RW 1403	RW 1408	North of the Sutton Road/Mimosa Terrace bridge

Source: DPTI.

4.1.2 Two sections of a revetment wall slumped in May 2019

In May 2019 the upper slopes of a revetment wall (RW 1102) slumped in two sections on the eastern side of the lowered motorway section between Flinders Drive and Sturt Road. The two slumps are shown in figure 4.2.

²⁶ South Australian Government 2019, House of Assembly, Public Works Committee, *North-South Corridor Darlington Upgrade*, Hansard, DPTI, 20 June, p. 5.

²⁷ Pointon, S, Gibbons, P & Cowan, S 2019, *Design and construction of cost-effective 60 degree revetment walls in unsaturated clay*, paper presented to Australia New Zealand Conference on Geomechanics, Perth, 2 April, viewed 8 October 2019, <<https://www.geomechanics2019.com.au>>.

²⁸ South Australian Government 2019, House of Assembly, Public Works Committee, *North-South Corridor Darlington Upgrade*, Hansard, DPTI, 20 June, p. 5.

Figure 4.2: Retevment wall slumps on eastern section of the lowered motorway



Source: Tony Lewis/InDaily.

Figure 4.3 shows the timing of key events in the revetment wall failure.

Figure 4.3: Chronology of events for the revetment wall failure

Date	Event
2 May 2019	Defects in the surface of the revetment wall are first observed
5 May 2019	A section of the revetment wall slumps
6 May 2019	Bulging and cracking is observed in another section of the revetment wall
8 May 2019	The second section of the revetment wall slumps
16 May 2019	The Public Works Committee opens an inquiry into the DUP due to the defects. The inquiry is yet to be finalised
6 September 2019	Gateway South submits a claim for \$29.2 million

Defects in the surface of the revetment wall were first observed on 2 May 2019.²⁹ Over the next two days the bulging and cracking of the shotcrete (spray-on concrete) surface progressed and then overnight between 4 May 2019 and 5 May 2019 the first section slumped.³⁰ Bulging and cracking in another section of the revetment wall was observed on 6 May 2019 and on 8 May 2019 this section also slumped.³¹

The walls were constructed from mid-2018 to early 2019 during a period of relatively low rainfall.³² The initial bulging and cracking of the shotcrete occurred during the first heavy rainfall at the project site for some months.³³

RW 1102 is about 220 metres long³⁴ with each slump being about 20 metres long.³⁵ The construction of the revetment wall was still in progress at the time, and shotcrete was applied but the panels that cover the wall face were not yet fixed.³⁶

We have not assessed the cause of the revetment wall defects. We note that this is still being determined by DPTI and Gateway South and is also included in the terms of reference for the Public Works Committee's inquiry into the DUP.

Sections 4.3 and 4.4 discuss the actions DPTI took to identify what caused the slumps, repair works by Gateway South and the impact on project cost and completion.

4.1.3 Features of RW 1102

RW 1102 is about 10 metres high and was excavated at a 60 degree angle with 110 millimetres of shotcrete applied to the surface of the embankment.³⁷ The shotcrete was then to be covered with non-structural concrete fascia panels.³⁸ The shotcrete and panels are used mainly to protect the surface of the soil from the weather.³⁹ Figure 4.4 shows the features of this revetment wall.

²⁹ South Australian Government 2019, House of Assembly, Public Works Committee, *North-South Corridor Darlington Upgrade*, Hansard, DPTI, 20 June, p. 5.

³⁰ South Australian Government 2019, House of Assembly, Public Works Committee, *North-South Corridor Darlington Upgrade*, Hansard, DPTI, 20 June, p. 6.

³¹ *ibid.*

³² Aurecon, *Darlington Upgrade Project Failure Report, Revetment Walls, Preliminary Report*, 19 July 2019.

³³ South Australian Government 2019, House of Assembly, Public Works Committee, *North-South Corridor Darlington Upgrade*, Hansard, DPTI, 20 June, p. 5.

³⁴ *ibid.*

³⁵ South Australian Government 2019, House of Assembly, Public Works Committee, *An Inquiry into the North-South Corridor Darlington Upgrade, Interim Report*, 10 September, p. 15.

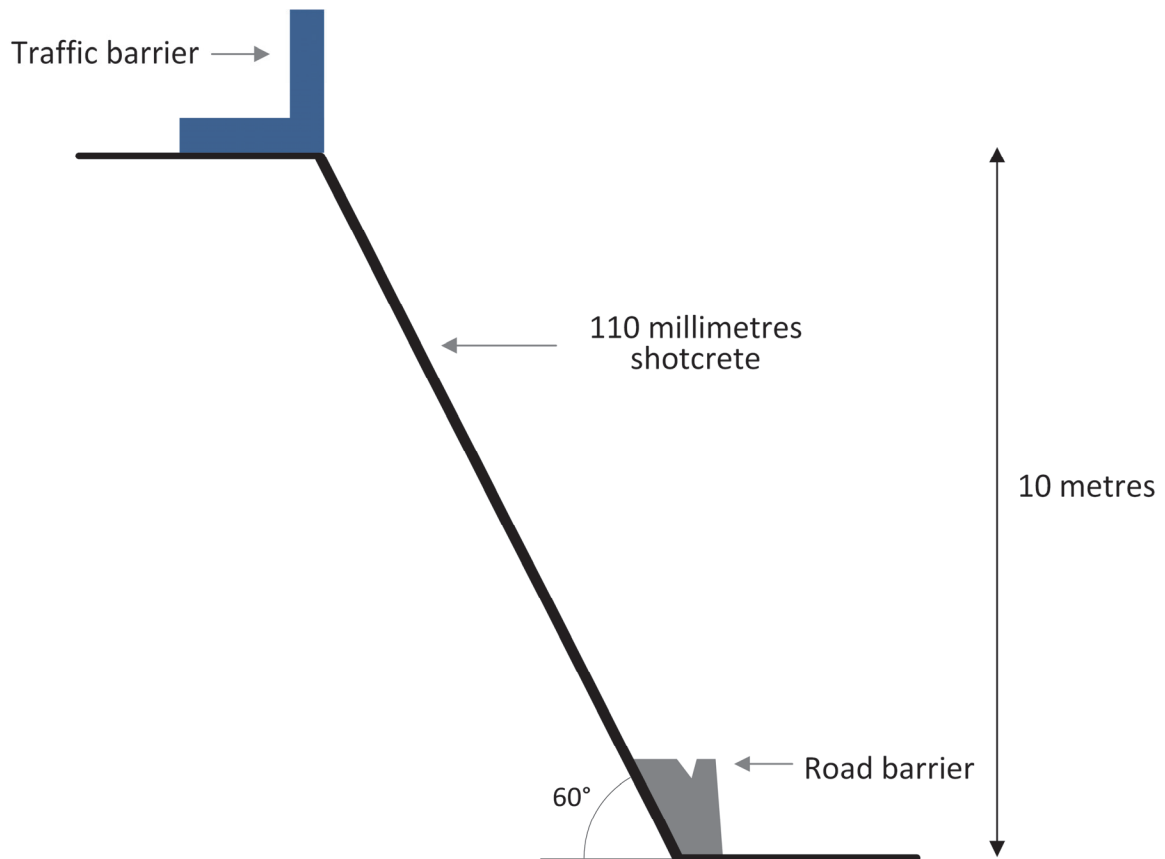
³⁶ South Australian Government 2019, House of Assembly, Public Works Committee, *North-South Corridor Darlington Upgrade*, Hansard, DPTI, 20 June, p. 5.

³⁷ South Australian Government 2019, House of Assembly, Public Works Committee, *An Inquiry into the North-South Corridor Darlington Upgrade, Interim Report*, 10 September, p. 14.

³⁸ South Australian Government 2019, House of Assembly, Public Works Committee, *North-South Corridor Darlington Upgrade*, Hansard, DPTI, 20 June, p. 5.

³⁹ South Australian Government 2019, House of Assembly, Public Works Committee, *North-South Corridor Darlington Upgrade*, Hansard, Aurecon, 20 June 2019, p. 3.

Figure 4.4: Features of RW 1102



Source: Developed from information in Aurecon's presentation to the Public Works Committee on 20 June 2019.

4.2 Public Works Committee inquiry into the DUP

On 16 May 2019 the Public Works Committee (PWC) resolved to inquire into the DUP due to the revetment wall slumps.⁴⁰

The terms of reference state that the PWC will inquire into and report on:

- the cause of the failure of sections of revetment wall
- the impact (including costs) of the failure on the project
- any other matter reasonably connected to the failure.⁴¹

On 10 September 2019 the PWC tabled an interim report for the inquiry. It summarises the evidence presented to the PWC so far. The PWC reported that it would continue its inquiry into the DUP and intended to prepare a final report containing recommendations to relevant stakeholders before the end of 2019.⁴²

At the time of this Report the PWC's final report had not been tabled.

⁴⁰ South Australian Government 2019, House of Assembly, Public Works Committee, *An Inquiry into the North-South Corridor Darlington Upgrade, Interim Report*, 10 September, p. 8.

⁴¹ Public Works Committee Inquiry North-South Corridor Darlington Upgrade, Terms of Reference.

⁴² South Australian Government 2019, House of Assembly, Public Works Committee, *An Inquiry into the North-South Corridor Darlington Upgrade, Interim Report*, 10 September, p. 1.

4.3 Actions taken by DPTI and Gateway South

4.3.1 Independent experts are investigating the cause of the slumps and reviewing the project's other revetment walls

DPTI engaged geotechnical experts from Aurecon and Wallbridge Gilbert Aztec to investigate and provide independent advice on the cause of the slumps, liaise with Gateway South on the stability of the slumps and give advice on the suitability of the rest of RW 1102. The external experts were first on the DUP site on 8 May 2019, shortly after the second slump.⁴³ DPTI has since increased the scope of the external experts' review to consider the suitability of other revetment walls constructed for the DUP.

The external experts' review is ongoing. In June 2019 Aurecon provided DPTI with a preliminary report that was updated in July 2019. A further updated report is expected by the end of 2019.

Section 4.3.1.1 discusses Aurecon's preliminary observations from its initial investigation.

4.3.1.1 Preliminary observations about the causes of the revetment wall failure

Based on its initial analysis, Aurecon advised DPTI that the cause of the slumps is a significant reduction in the overall strength of the soil mass due to three main factors:

- naturally occurring defects in the soil
 - the lower section of the batter faces includes a particular type of soil known as Hindmarsh Clay that contains naturally occurring defects (such as fissures and slickensides). During excavation these would have opened, allowing seepage of water to rapidly enter the wall face and greatly reduce the strength of the soil
- human constructed defects
 - the batter face contains human constructed defects such as the former trench wall of a replaced SA Water mains, abandoned conduits and pipes, and fill materials. The former trench runs parallel to the top of the revetment wall
- water seepage from an unknown source
 - it is most likely that the slumping of the batter faces was triggered by water seepage from a perched water table⁴⁴ entering the wall face. The seepage of water into the batter face reduces the strength of the soil and lubricates joints and fissures within the soil mass, causing slumps along the lines of weakness.⁴⁵

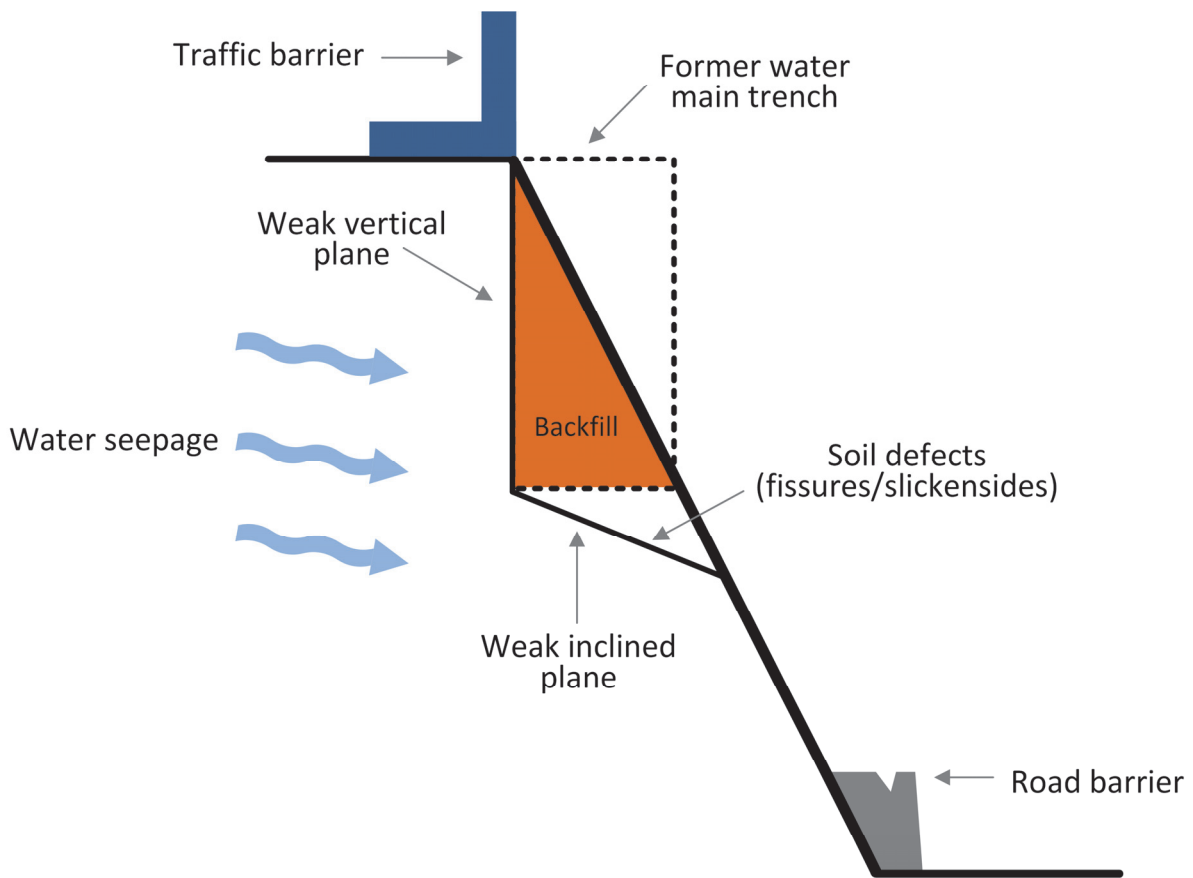
⁴³ South Australian Government 2019, House of Assembly, Public Works Committee, *North-South Corridor Darlington Upgrade*, Hansard, DPTI, 20 June, p. 6.

⁴⁴ A water tables that occurs above the main water table. The groundwater is usually trapped above an impermeable soil layer.

⁴⁵ Aurecon 2019, *Darlington Upgrade Project Failure Report, Revetment Walls, Preliminary Report*.

Figure 4.5 shows the factors identified by Aurecon and their impact on the strength of the revetment wall.

Figure 4.5: Factors that potentially caused the revetment wall slumps



Source: Developed from information in Aurecon's presentation to the Public Works Committee on 20 June 2019.

4.3.1.2 Conditions and factors leading to the two slumps may also be present at other DUP revetment walls

After considering the rest of the revetment wall away from the two slumped areas, Aurecon reported to DPTI that it believes:

- the conditions at the site of the slumps are not confined to that site, noting that further slumping has occurred between the two slumps
- the factors leading to the two slumps (in particular, soil defects) may be present elsewhere at the DUP site.⁴⁶

Aurecon recommended further investigation to increase confidence that the DUP's revetment walls are robust or to determine the need to strengthen them. Aurecon stated that it considers the eastern revetment walls (RW 1102, RW 1403 and RW 1404) need to be stabilised and that, depending on further investigations, a structural retaining system may also be needed to stabilise the western revetment walls to ensure a 100-year design life is achieved.

⁴⁶ Aurecon 2019, *Darlington Upgrade Project Failure Report, Retention Walls, Preliminary Report*.

Aurecon, on behalf of DPTI, has requested that Gateway South further assess the western revetment walls as a due diligence exercise to provide evidence that no significant water seepage can affect these walls. DPTI advised that Aurecon believes it will not be necessary to rectify the western revetment walls if the outcome of Gateway South’s assessment provides satisfactory evidence.

4.3.1.3 External experts are investigating how groundwater has impacted the site

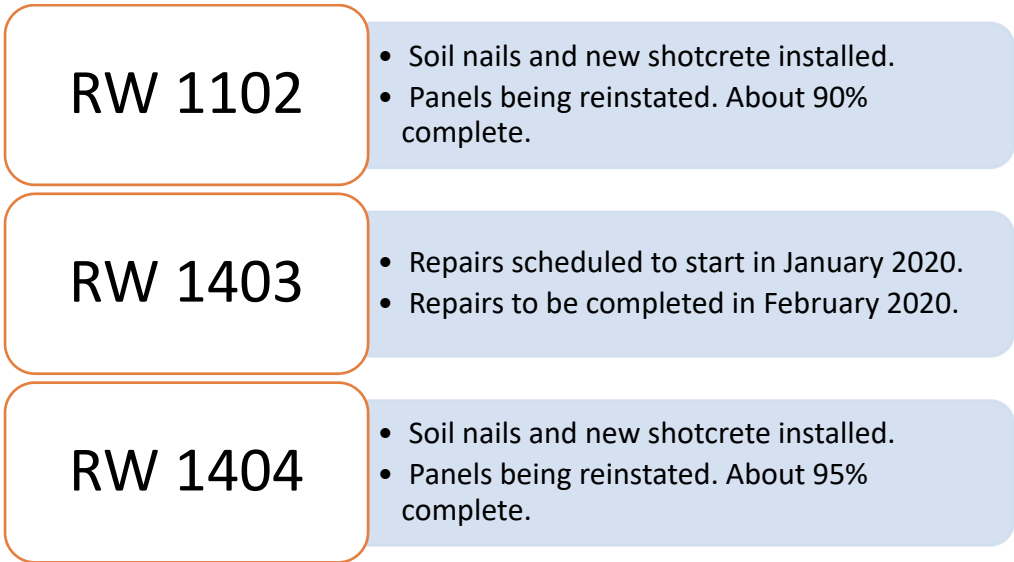
DPTI subsequently engaged Aurecon to also assess the site to investigate how groundwater has impacted the eastern revetment walls and contributed to the failures observed to date. This additional review will also inform the assessment of the western revetment walls discussed in section 4.3.1.2. Aurecon’s initial review identified various indicators of high water levels near RW 1102.

While this review is intended to inform the assessment of the revetment walls, DPTI advised that it is likely the investigation will also be useful for assessing groundwater at the piled retaining wall located next to RW 1102.

4.3.2 Status of repair works by Gateway South

Figure 4.6 summarises the status of repair works to the three revetment walls on the eastern section of the lowered motorway.

Figure 4.6: Status of repair works for the eastern revetment walls



Source: Developed from information provided by DPTI.

DPTI advised that Gateway South is progressing remediation works to the revetment walls by making them into retaining walls. Soil nails were installed in two walls to reinforce them and provide additional stability. This solution is designed to withstand conditions where water is present. The soil nails are up to 12 metres long and are connected to mesh that has

new shotcrete placed over it to create a reinforced concrete wall.⁴⁷ Figure 4.7 shows repair works being undertaken to RW 1102.

Figure 4.7: Repair works to RW 1102



Source: Aurecon presentation to the Public Works Committee on 20 June 2019.

4.4 Impact on project cost and completion

On 6 September 2019 Gateway South issued a \$29.2 million claim for costs of repair and rectification works, delay and disruption related to retaining and revetment wall defects.

Its claim also includes an extension of time of 227 days for them to complete the project. DPTI advised that it is still assessing the claim and that it is yet to be resolved.

Section 2.12.2 provides more details about the claim.

DPTI also advised that Gateway South expects to complete the DUP in June 2020 and that works to repair and rectify the revetment walls have contributed to project completion being delayed.

⁴⁷ South Australian Government 2019, House of Assembly, Public Works Committee, *North-South Corridor Darlington Upgrade*, Hansard, Aurecon, 20 June, p. 5.

5 Governance, reporting and accountability arrangements

What we found

Key governance arrangements were not established or implemented timely, clearly defined and documented. This included:

- the project's governance plan was still being developed and had not been approved
- a project management plan was established and approved well after project delivery started
- delegations for approving key project decisions were not established and clearly defined in documents that set out the project's governance arrangements
- tolerances for deviations from key project objectives and escalation processes were not defined, documented and approved
- reporting arrangements and escalation processes for the DPTI Chief Executive and governance groups were not clearly defined and documented.

Governance committees provided limited oversight for periods of the project. DPTI established two new governance committees in July 2019 to oversee major projects.

Detailed project status reporting was not prepared for senior management and governance committees.

The project's decision register did not include all key decisions and more guidance was required for project teams on which decisions should be recorded.

Processes to identify, consider and apply project learnings were not properly established and implemented. Key issues included:

- learnings for the DUP were not identified and recorded timely and information in the lessons learnt register was not complete
- no central mechanism to consider learnings from previously delivered projects and apply them to the DUP
- learnings identified from DUP utility service relocations need to be finalised.

What we recommended

To address shortcomings in establishing and clearly defining key project governance arrangements we recommended:

- for the DUP that DPTI:
 - finalise and approve the draft governance plan as soon as practical
 - consider the benefit of defining and documenting the tolerance levels and reporting framework for delivering the rest of the project.
- for future projects that:
 - key governance, reporting and accountability arrangements are established, documented and approved as early as possible in the project lifecycle.

DPTI should establish protocols for the two new governance committees to receive regular reporting on the DUP and consider and assess how previous governance groups operated to determine:

- effective processes
- gaps that need to be addressed.

DPTI should consider implementing detailed project management reports for the DUP and future large and/or complex projects.

Guidance should be provided to staff on the types of decisions to be included in project decision registers and a mechanism to ensure all key decisions for projects are recorded in this register in line with the procedural guidance implemented.

To ensure DPTI properly considers and applies project learnings we recommended that:

- processes to identify and record lessons learnt are in place when projects start
- the DUP lessons learnt register be updated to ensure that each issue clearly describes its impact on the project and includes recommended actions for future projects
- a process is established to actively share lessons learnt across DPTI projects and that new learnings are promptly shared when identified and easy for staff to access
- learnings from DUP utility service relocations are finalised as soon as practical.

5.1 Introduction

5.1.1 Governance arrangements need to be robust to effectively and successfully deliver major projects

I have previously reported that establishing and maintaining robust governance arrangements and effective management oversight processes is crucial to successfully deliver large and complex projects.⁴⁸

DPTI's project management framework reinforces this view. It outlines that Category 1 projects (those that are high value, high risk) such as the DUP require the highest level of management control and oversight as they expose DPTI to some of the highest levels of risks.

DPTI has defined a number of project governance requirements in its framework to provide a consistent approach to the governance of major projects.

The framework also explains that ineffective project governance is a significant factor that contributes to projects failing. This is because it can adversely impact project performance, outcomes and benefits and result in project delays and additional costs.

5.1.2 Symptoms of ineffective project governance

The framework explains that symptoms of ineffective project governance include:

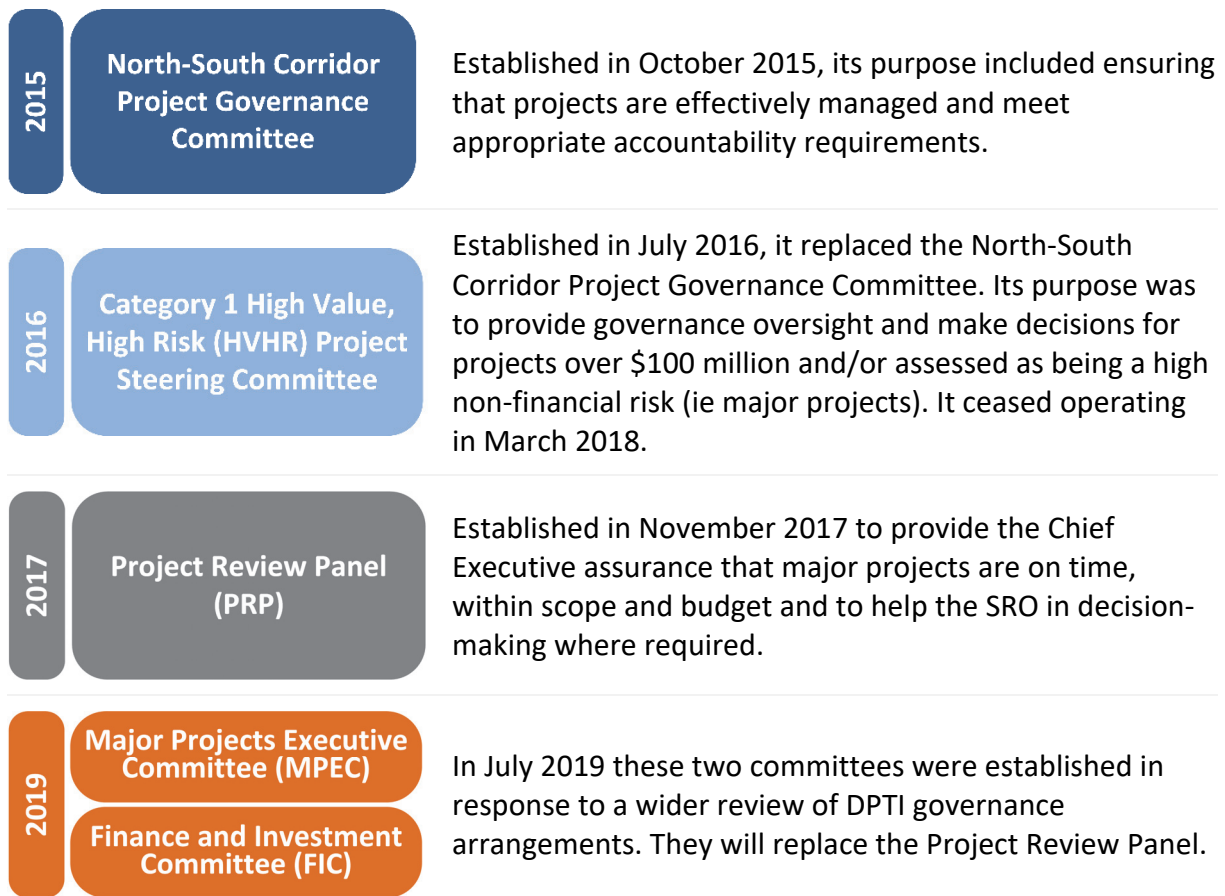
- failure to implement appropriate governance mechanisms when projects start and maintain them throughout each phase of the project lifecycle
- confusion about processes to escalate project risks, issues and decisions
- a lack of decisions or delays in making decisions
- poor communication between those involved in the project (lack of transparency, untimely decisions, not the right amount of information provided)
- governance meetings being reduced to status updates rather than decision-making
- key documents that provide clarity on the governance and management processes in place do not exist, or are incomplete, not approved, not updated or not actively used to govern or manage the project.

5.1.3 Governance groups responsible for overseeing the DUP

DPTI implemented governance structures and arrangements to oversee the DUP. Changes in these structures resulted in several different governance groups being responsible for overseeing the DUP during the project delivery phase, as shown in figure 5.1.

⁴⁸ Auditor-General's Report for the year ended 30 June 2015 *New Royal Adelaide Hospital: November 2015*.

Figure 5.1: Key governance groups responsible for overseeing the DUP



Source: Audit analysis of DPTI governance documents.

We did not review the MPEC and the FIC as these committees were not operational at the time of our review.

5.2 Audit approach

We assessed whether DPTI established effective governance, reporting and accountability arrangements.

For this review, we considered the governance requirements for major projects in DPTI's project management framework and best practice governance principles.

5.3 Findings

5.3.1 A governance plan was still being developed and yet to be approved

Recommendation

DPTI should finalise the DUP governance plan for the SRO to review and approve as soon as practical.

For future projects, governance plans should be finalised and approved by those responsible and accountable for project outcomes early in the project lifecycle.

Finding

DPTI's project management framework requires Category 1 projects to have a governance plan that documents the project's governance processes and mechanisms.

We found that a governance plan for the DUP was created in June 2019, more than three years after project delivery started and after key aspects of the DUP were undertaken. An October 2017 review of the DUP by external contractors also found that project governance lacked clarity, resulting in slow and confused decision-making processes.

A project's governance arrangements should be clearly defined and documented early in the project lifecycle and approved by those responsible and accountable for project outcomes. This helps ensure there is a common understanding of what the governance arrangements are and provides assurance to those responsible and accountable for project outcomes that they are adequate for the project's size, risk and complexity.

DPTI response

The DUP governance plan was finalised and approved by the SRO on 24 October 2019. For future Category 1 projects DPTI will:

- produce a revised and updated project management plan that includes all project governance requirements
- put in place measures that require finalisation and approval by the SRO as early as reasonably possible in the project lifecycle.

5.3.2 Governance committees provided limited oversight for periods of the DUP

Recommendation

DPTI should establish protocols for regular reporting on the DUP to the newly established governance committees (MPEC and FIC). It should consider and assess how previous governance groups operated to determine what processes were effective and to identify gaps that need to be addressed.

Finding

The Category 1 HVHR Committee provided limited oversight of the DUP

Our review of meeting minutes and papers found that the DUP was only discussed four times by the Category 1 HVHR Committee between July 2016 and January 2018. Matters discussed included the outcomes of two internal reviews of the DUP and decisions on a proposed scope change and funding for additional works.

This limited amount of review and involvement demonstrates that the Category 1 HVHR Committee did not provide the level of governance and oversight required for a project of this size, risk and complexity and outlined in its terms of reference.

The Project Review Panel replaced the Category 1 HVHR Committee. The Panel introduced a requirement for project managers to present key project risks and issues to the Panel at least quarterly. We consider this is a sound practice that enables project oversight committees to monitor and challenge those responsible for project delivery and make them accountable for ensuring project objectives are being met. We found that the DUP project manager and project lead regularly attended Panel meetings in line with the Panel's terms of reference.

The Project Review Panel was not a decision-making body which reduced its effectiveness

The Category 1 HVHR Committee had a role to make decisions on changes to scope, benefits, budget, resources and/or schedules during the project lifecycle. We note that the Project Review Panel, which replaced the Committee, was not a decision-making body and consider that this reduced its effectiveness. Consistent with this observation, in October 2018 the Panel discussed its effectiveness, including if review processes were adding value to projects and whether it could achieve more by being a decision-making body.

The Panel's purpose was considered as part of a wider review of DPTI governance structures. As a result of this review the Panel was replaced by the MPEC and the FIC. The draft terms of reference indicate that the Chief Executive will be the Chair of the MPEC and this committee will be a decision-making body. We understand the role of the FIC will also include approving project budget allocations and variations and releasing or applying contingencies. We consider the proposed arrangements are likely to improve the effectiveness of governance arrangements in place to oversee the delivery of major projects like the DUP.

DPTI response

DPTI has established protocols for regular reporting on the DUP to its new governance committees and these requirements are included in the DUP's governance plan.

Protocols for regular reporting and escalation to governance committees (in particular the MPEC and the FIC) will be included in the revised project management plan for Category 1 projects (the revised PMP Standard).

5.3.3 A project management plan was established and approved after project delivery started

Recommendation

Project management plans should be developed and approved before project delivery starts.

Finding

We found that a project management plan for the DUP was finalised in November 2017, almost two years after project delivery started. The plan was not approved by the project's then SRO but was updated by the project manager and approved by the current SRO in February 2019.

A project management plan should be developed and approved before project delivery starts to ensure there is a clear understanding of how key project activities will be managed, roles and responsibilities, and the project management practices that the project team will implement to achieve project objectives.

DPTI response

An interim project management policies guide has been developed and issued to relevant staff that states the requirements for project management plans, and the timing of their production and approval.

These requirements will be included in the revised project management plan for Category 1 projects.

5.3.4 Delegations that outline who can approve key project decisions were not established and clearly defined

Recommendation

DPTI should define and clearly document early in the project lifecycle delegations that outline who can approve key project decisions. It should ensure the delegations are approved in finalising a project's governance arrangements.

Finding

We found that delegations for approving key project decisions were not established and clearly defined in documents that set out the DUP governance arrangements. This includes who is authorised to approve changes to the project's scope, budget, contingency levels and departures from functional requirements and specifications.

Documented delegations of authority provide staff with clarity about their roles, responsibilities and limits and are necessary for agencies to operate efficiently and effectively.

We also note an internal review of the DUP in May 2017 identified that due to significant issues with promptly resolving and escalating issues there was a need to review and streamline project delegations. Further, in October 2017 an independent review of the DUP by external contractors identified a need to clarify and communicate the role and delegations of both the project manager and the SRO in line with the project's governance structure.

DPTI response

Roles and responsibilities, including key approval delegations, will be set out in the revised project management plan for Category 1 projects.

5.3.5 Tolerances for deviations from project objectives and escalation processes were not defined and documented

Recommendation

DPTI should consider and assess the benefit of defining and documenting the tolerance levels to be applied in delivering the rest of the DUP.

For future projects, tolerances and escalation processes should be established and approved early in the project lifecycle.

Finding

DPTI's project management framework requires tolerances to be defined and documented for Category 1 projects against the six project objectives shown in figure 5.2.

Figure 5.2: Tolerances for Category 1 projects

Project objective	Tolerance example
Time	+/- target completion date
Cost	+/- planned budget
Quality	+/- degrees of a quality target
Scope	Acceptable variation to the planned output
Risk	Limits on the project's aggregated risks
Benefit	+/- degrees of the targeted improvement

These tolerances must be documented and approved as part of a project's governance plan. Escalation processes must also be set up to ensure that tolerances forecast to be exceeded are immediately referred to the next level of management for a decision on how to proceed.

We found that tolerances for deviations from project objectives were not defined and documented and escalation processes were not set up.

We consider these requirements are sound practice that can be used by those responsible for overseeing projects to effectively manage issues and make key decisions. They should increase the likelihood that key decisions impacting on project objectives and outcomes are made timely and by the appropriate officer.

DPTI response

The DUP's governance plan has been updated to include tolerances for project objectives and an escalation pathway.

Requirements for defining and documenting tolerances on nominated project objectives will be set out in the revised project management plan for Category 1 projects, along with the required actions and escalation pathways when tolerances are exceeded.

5.3.6 Reporting arrangements not clearly defined and documented

Recommendation

DPTI should consider the benefit of defining and documenting the reporting framework to be applied in delivering the rest of the DUP.

For future projects, DPTI should ensure that a reporting framework, including escalation processes for decision-making, is finalised and approved early in the project lifecycle as part of establishing project governance arrangements.

Finding

Those responsible for project outcomes should be informed of project progress and issues regularly to enable appropriate and timely decisions to be made. Effective project reporting that provides the SRO, DPTI Chief Executive and governance groups with the right information at the right time to make informed decisions on escalated risks, issues and change requests should be adequately defined when a project starts. Reporting arrangements should be tailored for a project's size, risk and complexity.

The project management plan describes the DUP's reporting arrangements. This includes monthly 'dashboard' project status reports for review by DPTI executives and Ministers and external reporting to the Public Works Committee and Commonwealth Government.

We found that the plan does not outline the reporting arrangements and escalation processes for the DPTI Chief Executive and governance groups responsible for ensuring the project is delivered on time, within budget and with the intended benefits.

Project decisions should be made timely and at the appropriate levels. It is therefore important that a project team's authority for decision-making is defined and an efficient process is established for:

- reporting project progress
- escalating any decisions outside their authority to the appropriate governance level.

DPTI response

DPTI accepted the finding and advised that the mechanism for reporting and escalation protocols has been included in the DUP's project management plan and supplemented in the DUP governance plan.

For future Category 1 projects, reporting frameworks and escalation processes will be defined in the revised project management plan for Category 1 projects.

5.3.7 Lack of detailed project management reports provided to those charged with governance

Recommendation

DPTI should consider implementing detailed project management reports for the DUP and future large and/or complex projects.

Finding

We found that detailed project management reports outlining the status of the project were not prepared by the project delivery team and provided to those charged with governance. A well-designed project management report is a valuable tool to convey key project information to those responsible for overseeing the project and typically includes:

- progress of works
- milestones
- quality including status of defects and non-conformances
- risks and how they are being managed
- work health and safety matters
- budget and cost information
- procurement activities
- contract management including compliance, variations, disputes and claims
- stakeholder engagement.

We note for the DUP that the project manager prepared monthly project status reports that were presented to the SRO and key governance groups. These are high-level, one-page reports that are limited by the amount of information that can be included. This results in project governance committees being presented with insufficient detail to monitor significant project risks, issues and progress and reduces their effectiveness in monitoring project status.

Comprehensive project management reports enable a more detailed analysis and description of key matters impacting large, complex projects. The extra level of detail enhances transparency, accountability and critical evaluation of project delivery performance, issues and progress.

We note that external project managers have, for some projects, provided DPTI with detailed project management reports to help senior management oversee large complex projects.

DPTI response

DPTI noted that monthly project status reports are currently prepared to report on the status of large and/or complex projects. Notwithstanding this, a requirement for a standard form of monthly report from the Project Director to the SRO will be developed for Category 1 projects that, in principle, addresses the subject areas specified by Audit.

5.3.8 Decision register does not include all key decisions and more guidance is needed about which decisions are recorded

Recommendation

DPTI should review and update its existing procedures to provide guidance on the type of decisions to be included in project decision registers.

It should implement a mechanism to ensure all key decisions for projects are recorded in the project decision register, in line with the procedural guidance.

Finding

DPTI's project management framework requires a decision register to be maintained to ensure transparency and accountability for decisions made on escalated risks and issues.

We found instances where key decisions were not recorded in the DUP decision register, including:

- changes to design requirements that resulted in a \$27.4 million contract variation
- decisions made about proposed changes to project scope
- the decision to increase the project budget from \$620 million to \$667 million
- the decision made by a governance group to approve \$3 million for additional works.

Many of the items recorded in the DUP decision register were references to tools used to manage the project, such as the project's risk register, rather than specific decisions made on escalated risks or issues.

The project manager advised us that the DUP decision register was incomplete as it was developed in 2018 and was mainly used for decisions made on proposed departures from technical functional requirements. He also advised that there is a lack of guidance provided to project teams about the types of decisions that should be recorded on decision registers.

DPTI response

The DUP decision register has been updated to include the decisions identified by Audit.

DPTI notes that the governance plan currently identifies that the decision register is for 'decisions made on escalated risks and issues' and therefore a mechanism exists for defining, at a high level, the decisions to be recorded. However, it accepts that further guidance on the types of decisions to be included in the register will be beneficial. This guidance will be included in the revised project management plan for Category 1 projects.

5.3.9 Project learnings not identified and recorded timely

Recommendation

For future projects, DPTI should establish processes to identify and record learnings when projects start in line with DPTI policy requirements.

Finding

A lessons learnt register for the DUP was created in December 2018, about three years after the project delivery phase started.

The DPTI project management framework and intranet site require project managers to maintain active lessons learnt registers throughout the project delivery phase.

Not establishing processes to identify and record learnings when projects start increases the risk that important learnings are overlooked and also reduces DPTI's ability to address any learnings in remaining project phases. This self-reflection/evaluation process is particularly important for significant projects like the DUP that are complex and delivered over a number of years.

DPTI response

The interim project management policies guide outlines requirements for recording lessons learnt. However, DPTI accepts that there is value in developing a mechanism to identify, consider and apply lessons learnt systematically and will:

- revise and improve its system for documenting analysis and recording lessons learnt
- create a library of lessons learnt that projects can refer to
- establish a process for identifying, considering and applying relevant lessons learnt in developing a revised project management plan for Category 1 projects.

5.3.10 Lessons learnt register needs to be further developed

Recommendation

DPTI should review and update the lessons learnt register to ensure it clearly describes for each issue the impact on the project and includes recommended actions to consider for future projects.

Finding

Our review of the DUP lessons learnt register found that while project issues and learnings were identified and recorded, some details needed to be further developed and documented.

In particular, we noted instances where:

- descriptions of issues and their impact on the project were not clearly explained
- the impact of identified issues was not assessed
- recommendations for future projects were not documented for some issues that are applicable for other DPTI delivered projects.

Details on the DUP lessons learnt register need to be clearly explained and complete so that it can be used as an input into project close-out reporting and provides an effective resource for other project teams.

DPTI response

DPTI will review the lessons learnt register in line with the interim project management policies guide. DPTI also referred to its response in section 5.3.9.

5.3.11 No mechanism to consider learnings from previous projects

Recommendation

DPTI should establish a process to actively share lessons learnt across its projects. New learnings should be promptly shared, easy for staff to access and made available to all staff.

Finding

DPTI undertakes a wide range of infrastructure projects and learnings are gained from each phase of a project's lifecycle. These learnings are a valuable source of information that can promote desirable and prevent undesirable outcomes for future projects.

We found that DPTI did not have a mechanism to enable project teams to access and consider lessons learnt from other projects. This reduced the DUP delivery team's ability to consider and apply lessons learnt from other DPTI delivered projects.

After our review a central lessons learnt register was added to the Transport Project Delivery intranet site to help share project delivery learnings.

DPTI response

DPTI accepted the finding and referred to its response in section 5.3.9.

5.3.12 Learnings from utility service relocations need to be finalised

Recommendation

The discussion paper on DPTI delivered service relocations should be finalised. DPTI should consider and reflect the outcomes and learnings from the expert determination in the paper where appropriate.

The learnings should be made available and communicated to all relevant DPTI staff.

Finding

The DUP required significant utility service relocation works. Most of the service relocations were programmed as early works by DPTI to enable major construction works.

Significant program overruns occurred across all service types for DPTI delivered works. This resulted in DPTI failing to meet the established service delivery milestones and Gateway South submitting a number of extension of time claims. The financial and time impacts related to the DPTI delivered service relocations included:

- in June 2018 an independent expert determining that Gateway South was entitled to an extension of time of 55 calendar days and delay costs of \$5.3 million
- a Deed of Settlement being executed which resulted in DPTI paying \$6.25 million to Gateway South in October 2018 and extended the contractual completion date from 10 August 2019 to 17 December 2019
- Gateway South submitting a global disruption claim for \$49.3 million. The outcome of this claim was yet to be finalised.

In June 2017 DPTI prepared a draft discussion paper that identifies factors within its control or influence that contributed to the service relocation overruns.

We found that the paper contains detailed commentary and identifies important learnings for future projects but has not been finalised and updated to consider the outcome of the June 2018 independent expert determination.

DPTI response

A paper on DUP lessons learnt from services relocations will be finalised and used as a reference document to inform the planning and procurement of services relocation works in future Category 1 projects.

6 Risk management

What we found

The DUP risk management plan was still in draft.

The project management reporting tool limits the number of risks that can be reported to senior management and governance committees.

What we recommended

DPTI should finalise the DUP risk management plan for the SRO to review and approve.

For future projects, risk management plans should be finalised and approved by the SRO early in the project lifecycle.

DPTI should consider revising the project management reporting tool to allow more risks to be reported.

6.1 Introduction

A key feature of sound project management is to establish effective risk management processes and practices including identifying, recording, assessing and managing project risks.

Project risks are uncertain events or conditions that have the potential to adversely impact project objectives including time, cost and quality. They need to be actively managed and monitored by project teams and reported to those charged with governance to ensure that appropriate risk mitigation strategies are in place to reduce the likelihood of risks adversely impacting project objectives.

6.2 Audit approach

We reviewed whether DPTI had a robust and structured process to identify, manage and report project risks during the project delivery phase.

For this review, we considered the requirements of DPTI's risk management policies and procedures and project management framework.

6.3 Findings

6.3.1 The risk management plan was still in draft and yet to be approved

Recommendation

DPTI should finalise the risk management plan for the SRO to review and approve as soon as practical.

For future projects, risk management plans should be finalised and approved by the SRO early in the project lifecycle.

Finding

DPTI's project management framework requires a risk management plan to be developed for all Category 1 projects and approved by the project's SRO.

We found that a draft risk management plan for the DUP was created in June 2019, more than three years after project delivery started. The project manager advised us the draft plan was still being developed and the SRO will review and approve the plan when it is finalised.

A risk management plan summarises the proposed risk management approach for a project. It should be established and approved early in a project's lifecycle to ensure that appropriate risk management practices are established and implemented timely to effectively manage project risks.

The project management plan includes a risk management section which describes the processes that will be used to identify and record project risks. We noted it did not include details of reporting and escalation processes to be followed or the role and involvement of the SRO in reviewing and responding to project risks. The project manager advised us that these details would be included in the risk management plan that was being developed.

DPTI response

The DUP risk management plan was reviewed and approved by the SRO on 24 October 2019.

A revised and updated Risk Management Plan Standard (the revised RMP Standard) for Category 1 projects will be developed that will:

- provide clear guidance to project management leadership teams on the requirements for completion and initial sign off by the SRO early in the project lifecycle
- set out the requirements for periodic review, updating and exception reporting by the project manager to the SRO and/or the relevant governance forum.

6.3.2 The project management reporting tool limits the number of risks that can be reported

Recommendation

DPTI should consider revising the project management reporting tool to allow more risks to be reported.

Finding

DPTI's project management reporting tool summarises project information including project description, risks, milestones, KPIs and financial status. Project status reports from the tool are used by senior management and governance committees to monitor whether the DUP is on time, on budget and meeting quality requirements and benefit outcomes. Data is entered into the reporting tool monthly by the project manager.

We found the reporting tool limits the number risks that can be reported to three. We also found that there were periods where the DUP had more than three high risks. Limiting the number of risks may result in important information not being reported due to project managers having to use their judgement in selecting and reporting risks.

We note this limitation was also identified by DPTI in an internal audit of its city tramline extension project.

DPTI response

DPTI noted that current monthly project status reports include a reference and link to the project risk register. Notwithstanding this, it will:

- revise project reporting processes
- determine and implement a process for escalating risks to the appropriate governance group as part of the revised RMP Standard for Category 1 projects.

7 Contract management

What we found

There was a lack of documented evidence to support the basis for issuing a significant (\$27.4 million) contract variation six days after contract award.

Some contract management documents and processes were not established or not established and approved timely, including contract management plans and mechanisms to monitor and report on compliance with key contract deliverables.

Contract management reports were not prepared and provided to the project manager.

Gateway South and the construction verifier provided services before contracts were executed.

There was a lack of arrangements to ensure Gateway South complies with a contract requirement to maintain daily diary records of its activities and no processes in place to verify that those records are accurate.

No DPTI approval was provided for the project team's decision to not review and sign Gateway South's daily diary records.

DPTI made progress payments to Gateway South for works not yet undertaken and did not document its rationale for not following advice provided by the construction verifier about progress payments claimed.

Some payments made for works (dayworks) were not in line with contracted rates.

Details recorded in the project issues register were incomplete and long outstanding items had not been closed.

DPTI approved the construction verification and surveillance plan a year after construction review services started and had not reviewed the plan since then to ensure it was still current, suitable and effective.

Several construction verifier monthly reports were not provided to DPTI timely.

There were no processes to review and confirm the accuracy of Gateway South's workforce participation reporting.

Project documents were not always obtained and recorded in the project's information management system.

What we recommended

We recommended DPTI take the following actions.

Document and provide detailed analysis to decision-makers to support significant project delivery decisions including, contract variations.

For future projects, document contract management arrangements before contracts are executed and include processes to monitor and report on compliance with key contract deliverables.

Execute contracts before contractors start work and payments are made.

Implement a mechanism to ensure Gateway South prepares and maintains daily diary records. Further, DPTI representatives should review and sign these records or obtain approval to not review them after completing a risk assessment.

Ensure contractors are properly paid for works performed and document the rationale for not reducing contractor payment claims where the construction verifier recommends a reduction.

Agree payments claimed as dayworks to the contracted schedule of rates.

Clearly document and complete details in the project issues register.

For future projects where a construction verifier is used, review and approve the construction verifier's review methodology and planned approach:

- before it starts these activities
- periodically during project delivery to ensure it remains suitable.

Ensure that the construction verifier finalises and provides monthly reports to DPTI and Gateway South in line with contracted time frames.

Establish and implement processes to review and verify Gateway South's reporting on workforce participation targets.

Maintain a complete record of all project documents that support key project activities and outcomes, including those developed by the construction verifier.

7.1 Introduction

7.1.1 Why contract management is important

Contract management is the process of an entity managing the contractual relationships it establishes with suppliers to achieve the agreed contract outcomes, including addressing risks and disputes as they arise. It is therefore important that DPTI has a structured and effective approach to managing, reviewing and monitoring contract obligations and risks associated with the goods, services and infrastructure works that it procures.

7.1.2 A contract management plan is an important tool that helps to effectively manage significant contracts

A contract management plan is an important tool that contract managers should develop and use to help them manage significant contracts. It helps identify contract risks and outline the key strategies, activities and tasks required to manage a contract.

Key elements of an effective contract management plan include providing a mechanism for:

- identifying key contract provisions
- assigning responsibilities for ensuring both parties meet their obligations
- monitoring and reporting on compliance with key provisions.

A robust contract management plan that includes processes to monitor and report on compliance with key contract provisions is particularly valuable in helping contract managers to effectively manage large and complex contracts like the principal design and construct contract for the DUP.

7.2 Audit approach

We reviewed whether DPTI established robust contract management arrangements to ensure that it and Gateway South comply with key contract provisions and the project is delivered in line with these requirements. We also reviewed DPTI's:

- arrangements to ensure the construction verifier meets its contractual obligations
- processes/controls to verify Gateway South's progress payment claims
- arrangements to manage and approve contract variations
- contract management reporting
- delegations for contract administration and whether they were followed.

For this review, we considered:

- State Procurement Board contract management guidelines
- DPTI contract management procedures
- Austroads Guide to Project Delivery, Part 3, Contract Management
- other best practice contract management principles.

7.3 Findings

7.3.1 Lack of documented evidence to support the basis for issuing a significant contract variation six days after contract award

Recommendation

For significant project delivery decisions, including contract variations, document any detailed analysis undertaken and provide the analysis to decision-makers to enable them to properly consider, assess and evaluate key risks and issues.

Finding

In 2015 DPTI developed traffic model data for future years up to 2031 to confirm that future years traffic projections could be managed within the project's scope. Traffic volumes are important and need to be considered in the design process. This is to ensure the road to be constructed has sufficient capacity to meet future traffic demands and will operate safely and effectively. DPTI revised the 2031 traffic model data and issued it to Gateway South in 2016.

DPTI advised us that in undertaking the detailed design process (based on revised 2031 traffic model data), Gateway South identified changes to the project's design requirements. Revised traffic data was provided to Gateway South after it was announced as the preferred tenderer and had a significant impact on the scope of the works.

Six days after contract award, DPTI issued a contract variation instructing Gateway South to design and construct the works in line with the revised traffic data (the revised design is referred to as scheme 2D). The cost and time impact of adopting scheme 2D was significant. Figure 7.1 shows the timeline of events for the contract variation and provides details of the cost and time impacts.

Figure 7.1: Timeline of events for the contract variation

Date	Activity
20 December 2015	DPTI advises Gateway South that it has been nominated as the preferred tenderer and is required to start design development works.
8 April 2016	DPTI issues revised 2031 traffic model data to Gateway South.
12 May 2016	DPTI issues a letter of award to Gateway South. The letter includes contract documents that set out terms and conditions for DPTI to instruct the scheme 2D variation within three business days of it receiving the signed letter of award. This includes a maximum price of \$28.7 million and that the contractual completion date must not extend beyond 10 August 2019.

Date	Activity
18 May 2016	DPTI formally instructs Gateway South to design and construct the works in line with the revised 2031 traffic model and notes that cost and time impacts need to be further assessed before they are agreed.
31 August 2016	Formal instrument of agreement is executed.
2 March 2017	Gateway South submits a revised lump sum of \$27.4 million for the contract variation.
7 July 2017	The senior contract manager approves a contract variation to be issued for \$27.4 million. A variation order for this amount is formally issued to Gateway South. It extends the contractual completion date from 17 December 2018 to 10 August 2019.

We made the following observations about the contract variation that was issued.

Lack of documented analysis to support the basis for issuing the contract variation

We found that there was a lack of documented analysis to support DPTI's decision to adopt scheme 2D and instruct a significant contract variation six days after it issued the letter of award to Gateway South.

DPTI advised us that scheme 2D was reviewed by the former project manager and other DPTI technical specialist experts. Further, DPTI adopted scheme 2D to ensure that the motorway operates effectively when it opens and to address concerns about safety and the effectiveness of traffic movements.

We would expect documented analysis presented to decision-makers to have included:

- detailed risk analysis, market analysis and probity advice
- identification and evaluation of options (ie scheme 2B and scheme 2D)
- the rationale for modifying the initial traffic modelling data and the mechanisms in place to ensure the validity of this data
- evaluation of the validity of the proposed variation and the increase to the contract sum
- an assessment of the impact on the integrity of the procurement process, including why this matter was not resolved in selecting the preferred tenderer and negotiating the contract terms before issuing the letter of award.

Without documented analysis, DPTI cannot demonstrate that its decision-making process properly considered, assessed and evaluated key risks and issues.

We noted that the probity advisor provided probity observations relating to the revised traffic modelling information.

Lack of documented evidence to demonstrate who made the decision to instruct the contract variation

We also found that there was a lack of documented evidence to demonstrate which DPTI officer(s) made the decision to adopt scheme 2D and instruct Gateway South to design and construct the works in line with the revised 2031 traffic model.

The Director, Infrastructure Planning and Investment advised us that DPTI executive considered the decision to adopt the scheme 2D variation. He further advised that the senior project manager gave a verbal presentation to them on this matter but could not provide documented evidence of their approval or details of the information that they considered in the decision-making process.

DPTI advised us that:

- the Commissioner of Highways delegate signed the letter to Gateway South instructing them to proceed with the variation
- the adoption of scheme 2D was endorsed by the former North-South Corridor Steering Committee.

We noted, however, the draft terms of reference for the North-South Corridor Steering Committee indicate that its role was to provide high-level oversight of the overall corridor development. The Executive Director, Transport Project Delivery advised that for a variation of this size it is normal practice for the approving officer to evidence their approval by signing a minute describing the variation.

DPTI response

DPTI noted the finding and advised that the revised contract management plan for Category 1 projects will detail escalation processes for project delivery decisions, including contract variations.

7.3.2 A contract management plan for the principal design and construct contract was not finalised and approved timely

Recommendation

For future projects DPTI should ensure that contract management plans are developed and approved for all significant contracts before they are executed.

Finding

We found DPTI did not have a finalised and approved contract management plan for its design and construct contract with Gateway South when the contract was executed. While a draft contract management plan was prepared at that time we found that it was approved in February 2018, about two years after project delivery started.

Failure to develop and implement a contract management plan before large and complex contracts are executed may result in non-compliance with key contract provisions or contractor performance not being adequately monitored by DPTI and the intended contractual outcomes not being achieved.

DPTI response

DPTI noted that a draft contract management plan was implemented in May 2016 and acknowledged there were delays in the plan being formally approved.

DPTI accepted that contract management plans are good practice and should be developed to be consistent with the relevant acquisition plan at an appropriate stage in the procurement process.

For Category 1 projects, DPTI will set out the framework for the process, structure, content and approval process for developing revised contract management plans for material contracts (the revised CMP Standard) and the related monitoring and reporting requirements.

7.3.3 The contract management plan did not include key elements

Recommendation

DPTI should review the existing contract management plan and update it for the current organisational structure and, where still relevant, for key elements not included in the plan.

Finding

We found that the contract management plan for DPTI's contract with Gateway South did not include key elements of an effective plan. Specifically, we found that it:

- did not identify key contract risks and document how they would be addressed
- focussed on activities required to meet DPTI's contractual obligations but did not include arrangements for managing Gateway South's contractual obligations. For example, its obligations to achieve certain workforce participation and infrastructure sustainability targets
- had an outdated contract management structure that did not reflect the current organisational structure and included former DPTI employees
- did not explain the construction verifier's role in reviewing progress payment claims and actions required to respond to their advice
- outlined arrangements for reporting from the contract manager to the project manager but did not explain processes for reporting and escalating matters to senior management within the Procurement and Contracting unit.

DPTI response

DPTI will review the contract management plan and update it to reflect the ongoing requirements (including the matters outlined by Audit) for the remainder of the contract and set out the reporting requirements.

7.3.4 Lack of mechanism to monitor and report compliance with contractual provisions

Recommendation

DPTI should update the contract management plan to include processes to monitor and report on compliance with key contract provisions.

For future projects monitoring and reporting on compliance with key provisions for significant contracts should be implemented.

Finding

We found that contract management staff had not established mechanisms to monitor and report on whether DPTI and Gateway South were complying with contract provisions.

We noted that fortnightly contract status reports prepared by the contract manager for the Manager, Contract Management Operations focussed on issues and upcoming milestones but they did not report on compliance with contract provisions.

Arrangements for managing contracts should include monitoring and reporting on compliance with contract provisions to enable DPTI to respond promptly to any non-compliances.

DPTI response

DPTI accepted the finding and referred to the proposed actions outlined in its responses in sections 7.3.2 and 7.3.3.

7.3.5 Contract management reporting was not prepared and provided to the project manager

Recommendation

The contract manager should provide regular contract management reporting to the project manager in line with reporting arrangements in the contract management plan.

Finding

We found that the contract manager provided no formal reporting to the project manager.

The contract management plan for DPTI's contract with Gateway South requires the contract manager to regularly report to the project manager, including:

- updates on design status and issues
- current contract expenditure
- projected contract expenditure and cash flow forecasting

- contract variation status, including all current and potential variations
- extensions of time status and date for practical completion
- status of the contractor's progress and program
- other issues likely to impact on any of the above.

The contract manager and project manager advised us that they regularly discuss these matters as they are both based at the DUP site office. In my view the requirement for the contract manager to provide regular written reports to the project manager is a sound practice that makes both officers accountable for ensuring that contract issues are effectively communicated, managed and escalated where required.

DPTI response

The revised contract management plans for material contracts (revised CMP standard) will set out requirements for contract managers to prepare reports.

7.3.6 Gateway South provided services before a contract was executed

Recommendation

DPTI should execute contracts before contractors start work and payments are made.

Finding

We found that Gateway South provided services for about eight months before a formal instrument of agreement was signed.

On 20 December 2015 DPTI advised Gateway South that it was nominated as the preferred tenderer and to formalise and execute the contract Gateway South needed to undertake design development works and project documentation updates. DPTI advised Gateway South that it could also start other activities including site investigations to progress the design of the works and establish site office accommodation.

DPTI issued a letter of award to Gateway South on 12 May 2016 and a formal instrument of agreement was executed by the parties on 31 August 2016. Early works agreements were entered into with Gateway South for works/services performed before the letter of award.

We noted that DPTI paid Gateway South \$5 million for early works before the letter of award was issued and \$46.5 million before the formal instrument of agreement was executed.

Delays in finalising contracts results in the parties being unclear on their rights and obligations, particularly for complex contract works.

DPTI advised us that its practices changed from July 2018, with executed contracts now required before contractors start. We note that the contract with Gateway South was entered into before this requirement was introduced.

DPTI response

At the time the contract was awarded, it was a common practice to enter into an early works agreement to enable works to proceed in the interim, pending finalisation of approvals.

While technically the contract had been formed before works started, DPTI accepts this approach is not best practice. It has updated its contract formation processes and phased out using letters of acceptance and interim early works agreements.

For future Category 1 projects DPTI will formalise measures in the revised PMP Standard to ensure that contracts are executed before works start and payments are made.

7.3.7 No mechanism to ensure Gateway South maintains daily diary records of its activities

Recommendation

DPTI should implement a mechanism to ensure that Gateway South prepares and maintains daily diary records and that they are reviewed and signed by a DPTI representative.

Alternatively, DPTI should conduct a risk assessment for not reviewing daily diary records and get approval for not reviewing them.

Finding

Gateway South is contractually required to record its plant and labour activities against the appropriate lot (ie work package) on a daily diary form. These records must be provided to DPTI by the end of the next day.

The contract requires these records to be signed by Gateway South and DPTI and states that if the parties disagree with the details recorded, DPTI's objection should be documented.

The contract states that the purpose of these records is to help to value variations and claims and make determinations for extensions of time to complete the works that may arise.

We noted that in March 2017 DPTI informed Gateway South of the requirement to provide unimpeded access to daily diary records. However, we found that DPTI did not have arrangements in place to ensure that Gateway South was maintaining them. At the time of our review, DPTI was not aware of the location of these records.

We also found that DPTI officers did not review and sign these records to confirm that they accurately represented Gateway South's activities.

The contract manager advised us that:

- there is a general understanding that hard copies of the daily diary records are available in the DUP site office

- these records do not form part of DPTI's project records
- the requirement for DPTI to verify and sign the daily records is considered impractical on a large-scale design and construct project due to the volume of them
- these arrangements are more suited to construct only contracts, which is what the specifications were initially written for.

We recognise there may be practical difficulties in reviewing and signing the daily records. However, reviewing these records enables DPTI officers, where appropriate, to challenge representations made by Gateway South on them. Therefore, the review would improve DPTI's ability to substantiate variation and extension of time claims and potentially resolve other disputes.

DPTI response

The finding is noted, however it is impractical and potentially an inefficient use of resources for DPTI to continuously review daily diaries. Rather, subject to legal advice, DPTI proposes to establish contract provisions for Category 1 projects that oblige contractors to keep daily diaries and to certify in monthly progress payment claims that they have been properly maintained. Contracts will also include audit provisions.

A risk-based approach will then be used to determine the extent to which DPTI should conduct or commission audits of the accuracy and completeness of daily diary records.

The revised CMP Standard for Category 1 projects will set out the requirements for maintaining daily records and determining appropriate oversight processes.

Subject to legal advice, DPTI will also review whether contracts can be modified to include provisions that would limit exposure should daily diaries not be properly maintained.

7.3.8 No approval for the project team's decision to not review and sign daily diary records

Recommendation

DPTI should ensure that any proposed departures from tasks required by contract provisions are approved by the DPTI officers who are responsible and accountable for achieving project objectives and outcomes.

Finding

We found that no approval was given by DPTI for the project team's decision not to review and sign Gateway South's daily diary records to confirm that they accurately record activities undertaken.

Given the purpose of this activity and the potential consequences to the State of not doing it (as outlined in the contract), formal approval to not perform this activity should have been obtained from DPTI officers who are ultimately responsible and accountable for achieving the project's objectives and outcomes (eg the project's SRO).

DPTI response

The revised CMP Standard for Category 1 projects will set out the process for determining proposed deviations from contractual tasks, the approval process and how the decision is to be documented.

7.3.9 Details recorded in the DUP issues register are incomplete and long outstanding items have not been closed

Recommendation

DPTI should ensure that details recorded in project issue registers are clearly documented and complete to demonstrate that issues are being effectively managed.

Finding

A project issue is a concern that may become a risk to the project's progress and objectives (eg in terms of time and cost) if not promptly addressed and resolved.

DPTI's project management framework states that all projects should maintain an issues register for the life of the project. The register's purpose is to record project issues, details of how they are being managed, who is responsible for managing each issue and their current status. The project manager, with input from the project team, prepares the register as an internal working document.

Our review of the DUP issues register noted instances where:

- identified issues and actions were not clearly explained and documented
- no due date was recorded for when issues needed to be resolved
- dates that issues were identified and resolved were not recorded
- actions taken or planned to be taken to address issues were not documented
- long outstanding issues were still open, including instances where actions had been taken but the register was not updated to document them and close out the issues.

The issues register lasts for the entire project life and acts as a historical record of matters that have been resolved. It is therefore important to ensure that issues and actions are clearly documented. This increases transparency for actions taken to address issues and also helps if the project team changes and a handover of the register is needed (eg when a project moves from planning to delivery).

DPTI response

DPTI accepted the finding and advised that the issues register was reviewed in October 2019. DPTI also noted that requirements for developing and reviewing issues registers are included in the interim project management policies guide.

Requirements for recording, managing and escalating issues in the issues register will be updated and included in the revised RMP Standard.

7.3.10 The construction verifier provided services before a contract was executed

Recommendation

DPTI should ensure that future procurement planning processes provide sufficient time to:

- obtain approval for the full scope of services from officers who have the required authority under Treasurer's Instruction 8 *Financial Authorisations* (TI 8)
- execute contracts before services start and payments are made.

Finding

We found the construction verifier provided services for almost five months before a letter of award was issued and six months before a formal instrument of agreement was executed. We also found they provided services for about a month without any form of agreement in place, as an existing early works agreement lapsed and was not extended.

Figure 7.2 shows a timeline of the procurement process including contract execution.

Figure 7.2: Timeline of the procurement process

Date	Procurement activity
31 August 2016	DPTI advises the construction verifier it has been nominated as the preferred tenderer and can start certain activities up to \$110 000.
28 September 2016	DPTI extends the arrangements to 21 October 2016 and increases the maximum value of services to \$200 000.
21 October 2016	DPTI extends the arrangements to 25 November 2016 and increases the maximum value of services to \$300 000.
28 October 2016	The Minister for Transport and Infrastructure approves the construction verifier's tender for the full scope of services for an estimated cost, including contingencies, of \$6.8 million.
21 December 2016	DPTI issues a letter of award to the construction verifier. The letter states that copies of the formal instrument of agreement will be forwarded for signing.
14 February 2017	Formal instrument of agreement signed.

As figure 7.2 shows, the construction verifier was authorised to start certain activities while contract award for the full scope of works was being finalised. These activities included:

- reviewing DPTI's contract with Gateway South, including the contract scope and technical requirements document
- reviewing certain project management documents developed by Gateway South, including its quality management plan and inspection and test plans
- developing a construction verification and surveillance (CVS) plan and establishing document management processes

- reviewing the latest construction schedule and developing a construction verification schedule/milestones
- being introduced to the Teambinder information management system.

We also note the construction verifier started site surveillance activities in September 2016.

Allowing a contractor to provide certain services before obtaining the required approval for the full scope of services limits the effectiveness of the approval framework contained in TI 8. Procurement planning processes should have allowed for sufficient time to obtain approval for the total value of the contract and full scope of works from the Minister and for a contract to be executed before the construction verifier started providing services.

The part approval exposed DPTI to the risk of incurring unnecessary or additional costs had the Minister decided not to approve the contract.

As discussed in section 7.3.6, DPTI has since changed its practices to require executed formal instrument of agreements before contractors start.

DPTI response

Consistent with its response in section 7.3.6, DPTI advised that in 2018 it amended its previous practice of entering into early works agreements and that this practice was followed at the time it entered into the contract with the construction verifier.

7.3.11 No contract management plan for the construction verifier

Recommendation

For future projects, DPTI should develop contract management plans before contracts are executed and ensure that they include processes to monitor and report on compliance with key contract deliverables. The plans should be reviewed periodically over the life of the contract so that they remain current and reflect any organisational changes.

Finding

We found that DPTI did not have a contract management plan for services provided by the construction verifier and had not established mechanisms to ensure DPTI and the construction verifier comply with contract deliverables.

We found a number of examples where contractual provisions were not met, including:

- an instance where the construction verifier did not conduct a scheduled quarterly work, health and safety audit
- monthly reports, audit reports and daily diary records not provided to DPTI within required time frames, including some audit reports and daily diary records not provided at all until we requested them
- certain audits listed in the contract that were not conducted by the construction verifier, including for workforce participation reporting, sustainability and traffic management

- DPTI did not issue a delegation instrument to the construction verifier to enable it to release construction hold points on its behalf. Despite this, the construction verifier released many hold points
- the construction verifier provided services for about a year before DPTI approved its CVS plan. DPTI's approval of the plan was a condition precedent under the contract to start construction review services
- the construction verifier has not established a quality management system that is third party accredited as it is required to. Instead it is using Gateway's South's quality management system.

These examples highlight the need, before contracts are executed, to establish processes required to effectively manage contract requirements, including compliance by DPTI and contractors with contract deliverables. It is also important that arrangements for managing contracts include reporting on the status of compliance with contract deliverables to enable DPTI to respond promptly to any non-compliances.

DPTI response

DPTI accepted the finding and advised that the revised CMP Standard will include provisions for periodic reviews of contract management plans and triggers for reviews, including organisational changes.

7.3.12 CVS plan was approved by DPTI a year after construction review services started

Recommendation

For future projects where DPTI uses a construction verifier, it should ensure that it reviews and approves the construction verifier's review methodology and planned approach to undertaking surveillance activities before these activities start.

Finding

The construction verifier is contractually required to develop and implement a CVS plan. The contract states that approval of the CVS plan is a condition precedent to enable the construction review services to start.

We found that DPTI approved the CVS plan a year after the construction verifier started providing construction review services. The construction verifier started surveillance activities and developed a draft CVS plan in September 2016 that was approved by DPTI in September 2017.

The CVS plan is an important document that describes how the construction verifier will:

- manage its surveillance and verification of Gateway South's activities and works
- conduct review processes and the contract deliverables, review methodology and performance targets, management responsibilities and applicable procedures for each process.

DPTI should have reviewed and approved the CVS plan before services started, in line with the contract. This would ensure that the construction verifier's proposed services, review methodology and level of assurance to be provided is in line with what DPTI requires to verify major construction works are delivered to the required standard.

DPTI response

DPTI acknowledged there were delays in formally approving the CVS plan and advised that it accepts these delays should not have occurred.

For future Category 1 projects, the revised CMP Standard will address the requirements for engaging a construction verifier, if required. It will set out how DPTI is to monitor the performance of their work, how their reports will be managed and the process for conducting reviews to ensure ongoing effectiveness.

7.3.13 No ongoing review of the CVS plan to ensure it is current, suitable and effective

Recommendation

DPTI should review the CVS plan periodically to assess and confirm if the construction verifier's planned approach and activities remain suitable and effective. The CVS plan should be updated when the construction verifier's planned approach or activities change.

For future projects where DPTI uses independent construction verifiers to certify construction processes, it should ensure that CVS plans are regularly reviewed.

Finding

DPTI's contract management plan for the principal design and construct contract states that management will review the CVS plan at least annually to ensure that it continues to be suitable and effective.

We found DPTI had not reviewed the CVS plan since it was approved in September 2017 and also noted instances where the CVS plan did not reflect the current approach and activities undertaken by the construction verifier.

For example, the CVS plan outlines that verification activities will be undertaken using a risk-based approach. The project team advised us that, due to a number of issues identified during the DUP, the construction verifier has determined that the level of review initially planned under the risk-based approach is no longer suitable. We also noted that audits of activities, such as traffic management and sustainability, are included in the CVS plan to be carried out by the construction verifier but are being managed by DPTI instead.

The contract manager advised us that since our review DPTI has requested that the construction verifier review and update the CVS plan.

DPTI response

DPTI accepted the finding and referred to its response in section 7.3.12 for proposed actions.

7.3.14 DPTI did not document its rationale for not following progress payment advice from the construction verifier

Recommendation

DPTI should ensure that contractors are properly paid for works performed and document its rationale for not reducing contractor payment claims where a construction verifier recommends that they be reduced.

Finding

Gateway South submits monthly payment claims to DPTI that must identify the work and materials that the claim relates to and their value. Each payment claim must also be supported by relevant calculations and conformance records. DPTI reviews the payment claim and must issue a payment schedule to Gateway South within 10 business days that details the amount to be paid and the reasons for any differences if this amount is less than what was claimed.

The construction verifier is required to review the monthly payment claims and advise DPTI of any items claimed that the construction verifier reasonably considers Gateway South is not entitled to payment for.

We reviewed a sample of 10 monthly payment claims and noted the construction verifier's review was required for eight of them.⁴⁹

We found that all eight payment claims contained instances where DPTI did not reduce claimed amounts in response to the construction verifier's advice. This included instances where the construction verifier advised that there was a lack of documented evidence submitted to support claimed items.

We also found instances where payments were made for works not yet undertaken.

We found that contract management staff did not document how they had considered and addressed the construction verifier's comments. The contract manager advised us that in certifying payment claims, DPTI places a high reliance on the construction verifier's knowledge of the actual progress of works obtained through their daily surveillance of Gateway South's activities. This highlights the importance of DPTI reviewing the construction verifier's comments and demonstrating that it adequately considers and addresses them before making payments.

DPTI response

DPTI has amended the DUP payment schedule to include details of where payments differ from recommendations made by the construction verifier.

⁴⁹ One payment claim was before DPTI engaged the construction verifier and another did not require review by the construction verifier as it was a request for a prepayment to be made under a specific contract provision that could be assessed by DPTI contract management staff.

7.3.15 Some payments made for works (dayworks) were not in line with contracted rates

Recommendation

In reviewing Gateway South’s monthly payment claims DPTI should ensure that payments claimed as dayworks agree to the contracted schedule of rates or other rates approved by DPTI before works were undertaken (for instances where items are not listed in the contract).

Finding

DPTI can instruct Gateway South to carry out any additional work as daywork.⁵⁰ The variations register as at 28 August 2019 states that about \$2 million in contract variations have been issued as dayworks. Payment for these works is based on daily time and cost records for labour, plant, materials and services.

The contract includes a schedule of hourly daywork rates to be applied to Gateway South’s personnel (ie labour), plant and leased/hired plant. The schedule also outlines the margin to be applied to these rates for overheads and profit.

Our review of the sample of 10 payment claims found a number of instances where daywork rates claimed by Gateway South and paid by DPTI were higher than the schedule of rates. The discrepancies we found are summarised in figure 7.3.

Figure 7.3: Discrepancies in daywork rates paid

Description	Schedule of rates	Claimed amount paid by DPTI
Carpenter	\$65	\$71
Carpenter	\$65	\$103 (Saturday rate)
Supervisor	\$98.75	\$103 (Saturday rate)
Surveyor	\$95	\$132.50

The schedule of rates for dayworks explains that the rates are for the contractor’s normal day shift hours of work. We note that the contract states that the contractor’s standard working days and hours include works undertaken on a Saturday.

The contract manager advised us that DPTI only reviews daywork amounts claimed for reasonableness. A detailed review to agree rates claimed as dayworks to the contracted rates is not performed. This increases the risk of DPTI overpaying Gateway South.

⁵⁰ Daywork is generally instructed when the contract administrator is not able to determine a reasonable rate or price for the proposed work and where the proposed work is minor in nature.

We also found four instances where Gateway South claimed and was paid a 33.14% margin for overheads and profit instead of 15% applied to the total daywork costs claimed in line with the contract. The contract manager advised us that DPTI identified this and reduced subsequent payment claims to correct the overpayments.

DPTI response

DPTI will amend its process for assessing monthly payment claims to ensure that scheduled rates are applied where they exist. For any deviations from scheduled rates the rationale will be recorded and appropriate approval obtained.

DPTI will also review and audit a sample of invoices previously paid and assess the rationale for any deviations from scheduled rates. The SRO and Director, Procurement and Contracting will review the audit findings and determine any further work that may be needed to reconcile and adjust payments previously made.

7.3.16 Delays in construction verifier monthly reporting to DPTI

Recommendation

DPTI should ensure that the construction verifier finalises and provides monthly reports to both DPTI and Gateway South within seven days of the end of each month in line with the contract.

Finding

The construction verifier is contractually required to provide monthly reports to DPTI and Gateway South within seven days of the end of each month.

We noted that the January 2019, March 2019 and April 2019 reports were provided to DPTI two to three months after the end of the month.

The construction verifier's monthly report is an important document that sets out:

- the verification, surveillance and auditing activities during the period
- a summary of the key risks, issues and areas of concern that it has identified
- verification issues noted with Gateway South's quality assurance system
- details of the surveillance and auditing activities proposed in the next period, including the outcomes of risk management processes used to determine the level and scope of these activities
- its evaluation of the resources that will be needed and are planned to be made available for upcoming activities
- any matter that has or is likely to have a material adverse effect on its progress and services provided, together with details on how it is dealing or proposes to deal with them.

Prompt monthly reporting ensures that both DPTI and Gateway South are formally notified of existing issues, risks and concerns and can take timely action to address matters raised.

We were advised by project team members that weekly meetings are held with the construction verifier that, in the absence of timely monthly reporting, provide an opportunity for the construction verifier to verbally raise matters with DPTI.

DPTI response

DPTI has taken steps with the DUP construction verifier to address outstanding reporting requirements as soon as practical.

7.3.17 Lack of processes to review and confirm if Gateway South's workforce participation reporting is accurate

Recommendation

DPTI should establish and implement processes to review and verify Gateway South's reporting on workforce participation targets to assess if contract objectives are being achieved.

Finding

An objective in DPTI's contract with Gateway South is to increase the employment and training of apprentices and trainees, displaced automotive employees, aboriginal people and local people with barriers to employment (the target group).

In line with this objective, Gateway South has a contract deliverable to ensure that:

- the number of onsite hours performed by people in the target group is at least 11% of the total project hours
- the sum of onsite hours performed by people in the target group and the number of hours of upskilling provided to people is at least 20% of the total project hours
- the onsite hours performed by aboriginal people is up to 2% of the total project hours.

The construction verifier has a contract deliverable to conduct half yearly audits of Gateway South's workforce participation reporting. We found the construction verifier had not conducted any workforce participation audits.

DPTI advised us that Gateway South report monthly to DPTI and the Office of the Industry Advocate on these requirements. Our review of the June 2019 monthly report found that it:

- was prepared to provide an update on the progress of meeting the commitments outlined in Gateway South's industry participation plan
- does not include details of hours worked by people in the target group. We note this is a specific contract deliverable and not a commitment in Gateway South's industry participation plan.

We found that DPTI has not established any other processes to review and confirm the accuracy of Gateway South's workforce participation reporting and determine if the contract deliverable is being achieved.

DPTI response

DPTI will include a requirement in the revised CMP Standard for Category 1 projects to establish provisions for recording and certifying workforce participation reporting. This will include provisions for auditing by DPTI.

7.3.18 Project documents not always obtained and recorded in the information management system

Recommendation

DPTI should maintain a complete record of all project documents that support key project activities and outcomes, including those developed by the construction verifier, in the DUP's information management system.

Finding

The Teambinder information management system is used by DPTI, Gateway South and the construction verifier to send correspondence and other project documents. DPTI also uses the system to store key project documents.

We found instances where project documents were not obtained by DPTI and recorded in Teambinder. These included:

- 10 of our sample of 19 construction verifier audit reports were not recorded in Teambinder and were only obtained by DPTI after we requested them
- daily diary reports prepared by the construction verifier including all reports for November 2017 and February 2018. The construction verifier sent these records to DPTI in Teambinder in August 2019 after we requested them
- surveillance reports prepared by the construction verifier. The Construction Manager advised us that these reports are considered to be part of DPTI project records and will be obtained from the construction verifier before the project is completed.

As mentioned in section 7.3.7, we also note that DPTI does not have arrangements in place to ensure it obtains daily diary records maintained by Gateway South and that they are not recorded in Teambinder.

DPTI response

DPTI accepted the finding.

8 Quality management

What we found

DPTI had not established a quality management framework for the DUP that outlines how it will ensure quality control for the project is effective.

The DUP engineering and design management plan was not finalised and approved.

There was no formal detailed review by DPTI of reports it received from the construction verifier.

Challenges faced by the construction verifier may result in conditional independent construction certificates being issued.

There were weaknesses in the management of non-conformances and hold points, including:

- a lack of effective mechanisms to manage and monitor the release of hold points
- the absence of mechanisms to track ongoing monitoring requirements after non-conformance reports (NCRs) are closed
- actions taken to close out non-conformances raised by DPTI and the construction verifier not always being recorded in the NCR register
- reporting on NCRs did not include details of their significance and potential impact on upcoming milestones, closure of work packages or project completion
- outstanding NCRs and hold points that require attention ahead of project completion
- hold points being released by the construction verifier without DPTI issuing a delegation instrument that is required under contractual arrangements.

We also found shortcomings in how defects were managed, including:

- processes and systems to manage defects not established timely
- some defects were not promptly recorded in the defect management system
- no status reporting on defects identified before a defect management system was implemented.

What we recommended

For future projects, DPTI should develop and document a quality management framework before project delivery starts and ensure that an engineering and design management plan is finalised and approved by an appropriate officer before design works start.

DPTI should conduct a detailed review of reporting provided by the construction verifier and document its response to identified key risks, issues and concerns that could impact project objectives and outcomes.

DPTI should appropriately investigate challenges faced by the construction verifier and take any action needed.

To ensure that mechanisms used to manage non-conformances and hold points are effective we recommended that:

- processes be established to track that ongoing activities recorded in closed NCRs are undertaken by contractors
- as part of project completion, DPTI make a risk-based assessment of the need to review closed NCRs to ensure that any ongoing requirements have been addressed
- details recorded in the NCR register are complete and explain the actions taken by DPTI and the construction verifier to address and close out the NCR
- DPTI consider the need for reporting on outstanding NCRs to include a summary of their overall significance and risks and identify those that require increased attention due to their potential impacts
- DPTI work with Gateway South and the construction verifier to assess and close out open NCRs and hold points to enable timely closure of lots (work packages)
- mechanisms are established that enable hold points to be effectively managed and ensure they are released in line with contractual time frames
- all construction verifier staff responsible for releasing hold points are authorised to do this.

To ensure that defects are properly managed we recommended DPTI:

- for future projects, promptly implement processes and systems used to identify, record and manage defects
- promptly record identified defects in systems that are used to manage them
- report the status of defects as they are identified during the project.

8.1 Introduction

8.1.1 Quality control and quality assurance processes

Effective quality management helps to ensure that works are delivered to required standards and projects are completed on time. It is important that construction of the DUP meets specified quality requirements so that the motorway achieves its intended life and performance at expected whole-of-life costs.

In quality assurance contracts⁵¹ like the DUP principal design and construct contract, contractors are required to ensure quality control over the works they undertake. This includes works undertaken by subcontractors. They must establish systems and procedures to provide information that demonstrates and provides assurance of that control.

The Austroads guide to road construction quality assurance (Austroads guide)⁵² states that road agencies have an obligation to satisfy themselves that contractors' quality control and quality assurance processes are working effectively. DPTI therefore needs to establish processes for the projects it delivers to obtain assurance that works comply with specified requirements.

8.1.2 Construction verifier

The Austroads guide also explains that it is essential for road agencies to establish sufficient independent monitoring and reporting of contractor quality assurance processes.

DPTI engaged an independent construction verifier for the DUP. Its role is to review, monitor and audit Gateway South's construction activities and quality assurance processes and verify that works comply with specified requirements.

8.1.3 Hold points

Hold points are a key step in the construction and quality assurance process. They provide an opportunity to inspect and verify that the contractor's work conforms to specified requirements before they start subsequent work.

Hold points are typically established to review and verify critical aspects that cannot be inspected or corrected at later stages in the construction process (eg because they will no longer be accessible).

The DUP principal design and construct contract has many hold points. This means DPTI must establish mechanisms to effectively monitor and release the hold points.

8.1.4 Non-conformances and defects

Non-conformances are instances where works undertaken by contractors do not comply with required specifications. Defects are similar and are described as non-conformances that continue to exist, or are identified, after lot packages are closed.⁵³

Gateway South is required to:

- review the cause of all non-conformances that are identified and develop corrective actions to reduce the likelihood that they will occur again
- identify and rectify defects and deliver the works defect free on completion.

⁵¹ Contracts that require contractors to establish quality control and quality assurance processes.

⁵² Austroads 2018, *Guide to Project Delivery Part 5: Road Construction Quality Assurance*, 9 April.

⁵³ *ibid.*

DPTI must ensure that non-conformances and defects are properly managed and that suitable actions are promptly taken to address them. If non-conformances and defects are not properly managed or addressed this increases the risk of works not delivered to required quality standards and delays to project completion due to outstanding defects.

8.2 Audit approach

We reviewed whether DPTI established processes to:

- ensure that works are undertaken by Gateway South to appropriate quality standards in line with contract specifications and requirements
- ensure that the construction verifier undertakes sufficient surveillance and audit of Gateway South's construction activities to verify that they are completed in line with contract specifications and required quality standards
- manage the review and release of hold points
- identify and manage non-conformances and defects and ensure prompt corrective actions are taken.

For this review, we considered DPTI's contracts with Gateway South and the construction verifier and best practice principles, including those outlined in the Austroads guide.

8.3 Findings

8.3.1 DPTI has not established a documented quality management framework for the project

Recommendation

For future projects, DPTI should develop a quality management framework before project delivery starts to ensure that it adequately assesses its requirements and arrangements in place to deliver works in line with required quality standards.

Finding

We found that DPTI had not established a documented quality management framework outlining how it will ensure quality control for the DUP is effective. DPTI advised that a number of tools and processes were established to manage project quality, including:

- using a standard design and construct contract that includes general conditions, the precedence of contract documents and commercial framework requirements
- the contract scope and technical requirements document, which includes compliance with relevant standards and specifications
- Gateway South's quality processes and procedures, which are subject to auditing
- the project management plan.

The project management plan for the DUP includes a brief section on quality management. This states that the project's quality requirements will be outlined in the contract scope and technical requirements document for each contract.

In addition, DPTI engaged an independent construction verifier to monitor and audit Gateway South's quality control and quality assurance processes. We consider this to be sound practice for large and complex projects like the DUP, as it provides a mechanism for DPTI to get assurance that these quality processes are operating effectively.

We found that the project management plan does not include an overview of DPTI's arrangements to ensure that works will be delivered to the required standard. This includes the role of the construction verifier, other DPTI quality management processes and a risk-based assessment of the level and focus of surveillance, audit and other activities that DPTI has identified are necessary to meet its assurance needs.

Further, we note that the tools and processes established did not consider the impact of project works not completed by Gateway South (eg utility service relocation works).

Developing a quality management framework before project delivery starts will help ensure that DPTI has considered its requirements and has effective and adequate mechanisms and resources to provide assurance that works are delivered in line with required standards. In developing these frameworks DPTI should consider specific risks associated with constructing road projects within South Australia including:

- specific challenges relating to local soil characteristics
- the approach to ensuring appropriate quality over the design of the road infrastructure including design review and sign-off processes, controls over design decisions, the role of design managers and the use of engineers (eg DPTI internal engineers, technical specialist advisors, the contractor's design engineers and proof engineers and independent verifiers)
- the impacts on the overall quality of the road project from works being undertaken by multiple contractors and utility service authorities (eg risks to the overall quality arising from works undertaken by different contractors/service authorities in relocating services).

DPTI response

DPTI will undertake a review to consider improvements to the quality management framework that it currently uses.

8.3.2 Engineering and design management plan was not finalised and approved

Recommendation

For future projects DPTI should finalise an engineering and design management plan and have it approved by an appropriate officer before design works start.

Finding

DPTI developed an engineering and design management plan for the DUP, but we found that it was a draft document that was not approved.

The purpose of the plan is to describe the overarching engineering systems framework used by the project team to complete the design works. It details the methods and personnel to be used to control the safety, quality, environmental cost, timing and integrity of the design.

The plan outlines the roles of DPTI, the contractor responsible for designing the works and the contractor's independent proof engineer in the design process. It also documents:

- the design review and acceptance process
- design change procedures
- design validation/verification/certification requirements
- design deliverable dates
- processes to resolve and escalate issues where there is disagreement within DPTI on any issues with the project's design.

Engineering and design management plans should be finalised and approved timely to ensure there is a clear understanding of the design processes to be implemented, how they will be managed, and the roles and responsibilities of DPTI and external parties in the design process.

DPTI response

For future Category 1 projects, DPTI will ensure that an engineering and design management plan is promptly established, approved and implemented. The requirement for an engineering and design management plan will be included in the revised PMP Standard.

8.3.3 No formal detailed review of reporting provided by the construction verifier

Recommendation

DPTI should conduct a detailed review of reporting provided by the construction verifier. It should document its response to key risks, issues and concerns that the construction verifier raises in its reports, including any actions to address them.

Finding

The construction verifier is contractually required to provide DPTI with monthly reporting on its activities and audit reports that document the outcomes of audits.

These are important documents that provide a summary of key risks, issues and areas of concern identified by the construction verifier and any matter that has or is likely to have a material adverse effect on its progress and services. The monthly reports are extensive and

provide information on surveillance, audit and verification activities along with details of non-conformance and defects.

We found that the project team members who receive these reports do not review them in detail and mainly rely on the construction verifier to raise matters in weekly meetings.

We asked project team members about several matters identified in the reports. We found that they were either not aware that the matters had been raised or asked that we speak with the construction verifier to understand them. This includes an issue raised by the construction verifier that, given challenges it is experiencing, it may have no option but to provide DPTI with conditional independent construction certification for most work packages. We note that this matter was raised in the June 2018 report (about a year before our review) and was also reported in following months.

This demonstrates the importance of reviewing the construction verifier's reports to ensure DPTI manages and responds timely to risks, issues and areas of concern that may impact project objectives and outcomes. It is also important that DPTI documents its response to key risks and issues that are raised, including any actions implemented to address them.

DPTI response

DPTI accepted the finding and referred to its response in section 7.3.12 for its proposed action.

DPTI will also establish a process in the revised CMP standard to review reports from the construction verifier to determine its response to risks or issues raised and document and track actions.

8.3.4 Challenges faced by the construction verifier may result in conditional independent construction certificates being issued

Recommendation

DPTI should investigate the construction verifier's concerns about the possible issue of conditional construction certificates and implement actions to address them.

Finding

As discussed in section 8.3.3, the construction verifier reported that, due to challenges it has experienced, it is likely to have no option but to provide DPTI with a conditional (ie qualified) independent construction certificate for most work packages.

Our review of the project's risk register noted that the specific concern raised by the construction verifier in its monthly reports was not recorded and assessed. We did note that in May 2018 the risk register recorded a risk about Gateway South's management of hold points that could result in conditional certificates or the inability to provide a verification certificate for certain works.

As mentioned in section 8.3.3 the project team was not aware that the construction verifier had raised this issue in its monthly reports.

DPTI should investigate this matter and take action to address the concerns raised. Further, if appropriate, DPTI should develop a strategy to respond if the construction verifier issues qualified independent construction certificates for certain work packages. This would include understanding which work packages are at risk and any implications for the project.

DPTI response

DPTI accepted the finding and referred to its response in section 8.3.3 for its proposed action.

8.3.5 Weaknesses in mechanisms used to manage and monitor the release of hold points

Recommendation

DPTI should establish mechanisms to effectively manage upcoming hold points and ensure they are released in line with contractual time frames.

Finding

We found that DPTI had not established an effective mechanism to manage and monitor the release of hold points.

Hold points are listed in the contract scope and technical requirements document to enable DPTI to verify that Gateway South's work conforms to the specified requirements before subsequent work starts. They need to be released by DPTI before further works can proceed.

Contract documents include time frames by which DPTI is required to release hold points or advise why they cannot be released. The time frames vary from as little as one hour to up to several weeks and start from when Gateway South supplies all relevant information to demonstrate that a hold point can be released.

Construction hold points

The construction verifier releases hold points for construction activities on behalf of DPTI. Gateway South uses its QAntrol quality management system to notify the construction verifier of upcoming hold points. The construction verifier also uses QAntrol to record review comments and release hold points.

Our review of QAntrol hold point data found instances where hold points were retrospectively entered into the system by Gateway South and then released by the construction verifier. The construction verifier's officers advised us there were many instances where they were verbally advised onsite of the need to attend and review hold points. Therefore QAntrol is not always an effective tool for scheduling and managing the release of hold points.

Non-construction hold points – design and other

DPTI reviews and releases design and other hold points in Teambinder. We noted that it had not established mechanisms to manage and monitor the release of these types of hold points. A spreadsheet to track and manage hold points was created earlier in the project but was not used as a control during the project.

The project team advised us that they use hold point trackers provided by Gateway South to monitor time frames for releasing these outstanding hold points. Our review of hold point trackers from July 2019 and August 2019 noted they were issued to DPTI every one or two weeks. This mechanism therefore does not provide DPTI with timely information to effectively manage the release of hold points within time frames required by the contract.

Without effective mechanisms to manage and release hold points they may not be reviewed before subsequent works start. Further, if DPTI does not review and release hold points within contractual time frames, contractors may submit extension of time claims where this delays their scheduled works program.

DPTI response

DPTI noted that administration of hold points is a contractual obligation to be performed by Gateway South. It also advised that the construction verifier is contractually obliged to perform audits and ensure compliance.

DPTI accepts that the mechanisms to manage and release hold points can be improved. It will revise and update its specified requirements to mandate the use of an electronic hold points register, to be configured to DPTI's satisfaction for the purpose of effectively managing hold points as recommended by Audit.

8.3.6 Hold points released by the construction verifier without delegated authority from the Principal's Authorised Person

Recommendation

DPTI should ensure that all construction verifier staff responsible for releasing hold points are authorised to undertake this task.

Finding

As at 31 July 2019 the construction verifier had released about 5000 hold points for construction activities on behalf of the Principal's Authorised Person.

The principal design and construct contract provides the Principal's Authorised Person with authority to release hold points and to delegate any of its contractual functions and powers to others by providing written notice to Gateway South. The contract further outlines the authority to release a hold point may be delegated to an independent reviewer (ie the construction verifier).

We found that the Principal's Authorised Person (ie DPTI representative) had not issued a delegation instrument to authorise the construction verifier to release hold points.

DPTI response

DPTI accepted the finding and advised that a formal letter of authorisation has now been issued to the construction verifier.

8.3.7 Processes and systems used to identify, record and manage defects were not established timely

Recommendation

For future projects, DPTI should promptly implement processes and systems to identify, record and manage defects.

Finding

Gateway South is contractually required to deliver works that are defect free on completion. We found that processes and systems used to identify, record and manage defects were not established and finalised timely.

The construction verifier highlighted to DPTI in its November 2018 report that Gateway South did not have a defects management system and there was minimal progress to develop one. It also reported there were project aspects, such as common services, drainage and shotcrete walls, that should be progressively reviewed for defects before overlying work proceeds and noted that this did not appear to have occurred.

In its January 2019 report, the construction verifier raised further concerns that the completions and defects management process had yet to be clearly documented and remained a major issue ahead of the next period.

We noted that Gateway South intended to use Teambinder to manage defects but, due to issues with its defect module, it decided to use another defect management system, Field View. In late February 2019 Gateway South's commissioning and handover plan was updated to include processes to identify and manage defects and it started using Field View.

The plan was updated again in September 2019 to further clarify the defect management process, including DPTI's role in attending defect walks and approving closed defects.

While Gateway South has to identify and rectify defects before completion, DPTI needs to ensure that processes and systems used to identify, record and manage defects are promptly established and implemented. This is important as if defects are not promptly identified and closed out there is an increased risk to DPTI that:

- quality issues may not be identified if overlying works have already proceeded
- projects are not delivered on time due to outstanding defects.

DPTI response

For future Category 1 projects DPTI will specify as a requirement the implementation of a proprietary software solution, approved by DPTI, that will enable the effective recording, reporting, management, status tracking and close out of defects.

8.3.8 Some defects were not promptly recorded in Field View

Recommendation

When defects are identified they should be promptly recorded in Field View.

Finding

We found defects identified for noise walls and the computer equipment room (CER) building were not promptly recorded in Field View.

For the 46 defects identified for the CER building we found that:

- they were identified in July 2018 and recorded by Gateway South in a spreadsheet that was provided to DPTI and the construction verifier
- from February 2019 Field View was used to record project defects
- DPTI advised Gateway South on 30 May 2019 that the CER building defects were not entered into Field View. This was about three months after the system was implemented
- Gateway South entered the defects into Field View on 17 June 2019.

We also found that 15 noise wall defects identified in 2018 were entered into Field View on 21 May 2019, about three months after the system was implemented.

DPTI response

DPTI accepted this finding.

8.3.9 No defect status reporting before Field View was established

Recommendation

DPTI should be provided with regular reporting on the status of defects during the project.

Finding

As discussed in section 8.3.8, defects were identified for the noise walls and CER building before Field View was implemented in February 2019. These defects were recorded and managed using spreadsheets.

We found that DPTI did not receive reporting on the status of these defects. Our review of monthly progress reports provided to DPTI by Gateway South and the construction verifier found that they did not include any reporting on the status of these defects.

Gateway South's spreadsheet for the CER building defects had a due date of 7 August 2018 to rectify these defects. At the start of July 2019, they were still outstanding. DPTI advised us that it did not expect the defects to be closed out by the contractor's due date and that Gateway South can only achieve project completion once all defects are closed out.

While Gateway South is required to deliver the works defect free, it is still important for DPTI to receive regular reporting on the status of defects as they are identified during the project. This ensures that defects are being effectively managed and closed out timely to reduce the risk of the project's completion date not being met due to outstanding defects.

We note that from February 2019 Gateway South implemented a completions dashboard that includes data on the progress of closing out all defects recorded in Field View, which DPTI can access and review.

DPTI response

DPTI accepted this finding. For future Category 1 projects it will specify as a requirement the implementation of a proprietary software solution, approved by DPTI, that will enable the effective recording, reporting, management, status tracking and close out of defects.

8.3.10 No mechanism used to track ongoing activities required after NCRs are closed

Recommendation

DPTI should establish processes to track and ensure that ongoing activities recorded in closed NCRs are undertaken by contractors.

As part of project completion, DPTI should consider and make a risk-based assessment of the need to review closed NCRs to ensure that any ongoing requirements are addressed.

Finding

Where Gateway South's work does not comply with a requirement specified in the contract it must issue an NCR. An NCR must only be closed after DPTI has approved that it is satisfied with actions taken to address the non-conformance.

We reviewed a sample of 15 closed NCRs to assess whether DPTI had reviewed and approved Gateway South's proposed actions to address each non-conformance and verified that appropriate actions (eg repairs) were completed before each NCR was closed.

We found that DPTI had no mechanism to ensure that where NCRs were closed subject to ongoing activities (such as monitoring) these activities were subsequently completed by Gateway South.

Figure 8.1 outlines three instances in our sample where we found that NCRs were closed subject to ongoing monitoring requirements.

Figure 8.1: NCRs closed and subject to ongoing monitoring requirements

NCR number	Description of ongoing monitoring requirement
0192	Review of as built survey information identified that areas of the bridge 2 deck level were lower than design. DPTI approved the NCR in July 2018 based on designer acceptance. Gateway South’s designers stated the road geometry needed to be checked for any potential re-grading to satisfy road and drainage requirements.
0208	No compaction testing was undertaken for drainage trench backfill on Sturt Road. DPTI accepted the proposed action to accept as is and the NCR was closed subject to Gateway South’s designers requiring the areas to be monitored over the next 12 months.
0234	Not enough backfill compaction testing was completed for a number of conduit installation work lots. DPTI accepted the proposed action to accept as is and the NCR was closed subject Gateway South’s designers requiring areas with insufficient testing to be monitored over the next 12 months.

Not establishing processes to track and ensure ongoing activities identified in closed NCRs are undertaken by contractors increases the risk of works not being delivered on time and to required quality standards.

DPTI response

DPTI will ensure for the DUP that closed out NCRs subject to ongoing activities are recorded in the defects register. The defects register will be reviewed and closed out as part of project completion.

8.3.11 Actions taken to close out non-conformances raised by DPTI and the construction verifier not recorded in the NCR register

Recommendation

DPTI should ensure that details recorded in the NCR register are complete and adequately explain the actions taken by DPTI and the construction verifier to address and close out the NCRs.

DPTI should document references to QAnrol NCRs where these are created and used to track non-conformances after they are closed on the NCR register.

Finding

NCRs can be issued by Gateway South, DPTI and the construction verifier.

Gateway South uses its quality management system (QAntrol) to record and manage NCRs that it identifies as well as those raised by DPTI and the construction verifier

The construction verifier has established an NCR register to record the NCRs that are issued to Gateway South and track the status of each non-conformance. We reviewed the NCR register and a sample of 13 NCRs recorded on it to assess the actions taken by DPTI and the construction verifier to monitor and close out the NCRs they issued.

Our review and discussions with the construction verifier's officers found that actions taken to close out NCRs were regularly not documented. As a result, they could not determine the actions taken without further investigation. This included instances where it was not clear if Gateway South had created NCRs in QAntrol which enabled items on the NCR register to be closed and tracked using QAntrol instead. Without processes to ensure all non-conformances are addressed by contractors there is increased risk that works are not delivered to the required standard.

We were also advised by the construction verifier that an NCR in our sample was recorded as closed on the NCR register but should still be open. We note for this NCR that no actions were recorded in the NCR register to explain how it had been closed.

DPTI response

For future Category 1 projects DPTI will specify the provision and implementation of a software solution for the effective management of non-conformances.

8.3.12 Reporting on NCRs could be improved to include details of their significance and potential impact

Recommendation

DPTI should consider the need for reporting on open NCRs to:

- include a summary of their overall significance and risks
- identify any specific NCRs that require increased attention due to their potential impact on upcoming milestones, closure of work packages or project completion.

Finding

Gateway South maintains a quality dashboard. This provides DPTI with the number of open and closed NCRs in QAntrol and other data such as a breakdown of NCRs by category (eg tolerances exceeded, test results, incorrect materials).

The project manager advised us that before certain programmed activities, such as a major traffic switch, DPTI reviews and assesses outstanding NCRs to determine their significance and impact on the scheduled activity proceeding.

We found that the quality dashboard and construction verifier's monthly reports do not include reporting on the significance and potential impact of NCRs on upcoming programmed activities and project completion.

Reporting details about the significance and risk of open NCRs would help to reduce the risk of delays to programmed activities or completion of work packages by highlighting the NCRs that require increased attention to ensure they are promptly addressed.

DPTI response

DPTI accepted this finding. For future Category 1 projects it will specify the provision and implementation of a software solution for the effective management of non-conformances.

8.3.13 Outstanding NCRs and hold points require attention ahead of project completion

Recommendation

DPTI should work with Gateway South and the construction verifier to assess and close out open NCRs and hold points to enable work packages to be closed timely.

Finding

We noted that as at 30 June 2019 there were 245 open NCRs in QAntrol. At 13 September 2019 there were another 85 open NCRs issued by DPTI and the construction verifier.

At 31 July 2019 there were 228 outstanding construction hold points recorded in QAntrol that had not been released by the construction verifier, with 106 of them for works undertaken before 31 December 2018.

These outstanding NCRs and hold points need to be assessed and closed out. Not reviewing and closing them out timely reduces the ability to close work packages, which may delay commissioning sections of the road for use by the public.

DPTI response

DPTI will continue to work with Gateway South and the construction verifier to assess and close out open NCRs and hold points to ensure timely closure of lots.

9 Utility service relocations

What we found

There was a lack of timely reporting to DPTI executive on the status of service relocation delivery and emerging issues and risks.

There was a lack of documented analysis to assess DPTI's ability to deliver service relocations works in line with proposed milestone dates.

Contract provisions did not enable DPTI to effectively manage the performance of Gateway South and service authorities.

DPTI should have allowed more time to properly review the impact of a significant scope revision and late changes initiated by Gateway South on delivering service relocations before agreeing to service relocation milestone dates.

Contract management plans were not established for works undertaken by service authorities and a contractor.

Tools used to manage and monitor the progress of works were not developed timely.

There was a lack of documented analysis to assess the impact of a significant contract variation on DPTI service relocation works.

What we recommended

For future projects that require utility service relocation works to be delivered by DPTI we recommended that:

- DPTI ensure those responsible for overseeing projects are provided with timely and sufficient information on the status of service relocation works, emerging issues and risks
- DPTI ensure contract provisions provide a robust mechanism for it to manage the performance of contractors and service authorities to reduce exposure to delay and disruption claims
- sufficient time is available to review impacts of any significant changes that are initiated by contractors and for changes proposed to project scope
- contract management plans are developed for significant contracts before they are executed. These plans should include processes to monitor and report on compliance with key contract deliverables
- tools to monitor and manage the progress of the works are established timely
- for significant project delivery decisions, document detailed analysis and provide it to decision-makers to demonstrate that DPTI has properly considered, assessed and evaluated key risks and issues.

9.1 Introduction

Background

A significant number of existing utility services along the DUP site needed to be relocated before major works started. They included:

- large diameter water mains and sewer infrastructure
- overhead and underground electrical infrastructure
- Telstra transmission and distribution feeds
- gas transmission and distribution pipes
- various other communication services.

These works needed to be completed promptly to enable major works to start on time and reduce the risk of delays to project completion and increased costs.

Contract arrangements for the works

The contract between DPTI and Gateway South establishes the responsibilities of both parties for service relocation works to enable timely project delivery. This required DPTI to complete various utility service relocations before Gateway South started major works. The contract also includes fixed milestone dates for the DPTI delivered service relocations.

DPTI had to relate with the service authorities⁵⁴ that own the assets being relocated and meet their technical requirements and specifications for the works to be completed. Service authorities also require that certain works are undertaken directly by them or their subcontractors where regulatory requirements apply. DPTI entered into agreements with each service authority to assist with managing the works it had to deliver. It also engaged a contractor to relocate water and sewer mains after determining it needed increased oversight of these works due to the risk of delays having a significant impact on major construction works.

As DPTI remained responsible for meeting the milestone dates, it needed to effectively manage and monitor the performance of the service authorities and other contractors.

DPTI failed to meet these milestones, resulting in significant delays and program overruns.

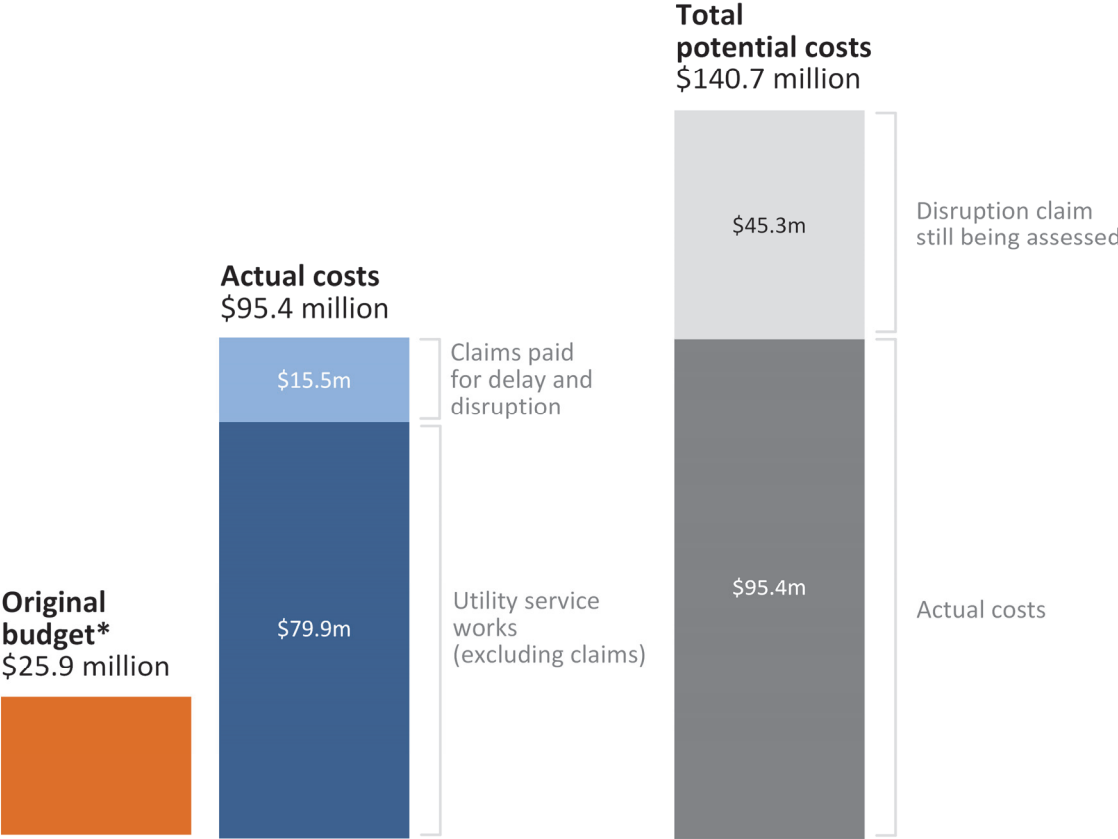
Financial and time impacts from program overruns

The project's initial budget of \$620 million included \$25.9 million for service relocations. DPTI advised us that on 30 November 2015 the estimated cost for utility services was revised to \$64.9 million which includes the impact of the motorway scope extension (see section 2.2.3.1). Figure 9.1 shows that as at 30 September 2019 the actual cost of these works was

⁵⁴ Government or private organisations responsible for the care and/or control of utility services.

\$79.9 million. This does not include an additional \$15.5 million that DPTI has paid to Gateway South for delay and disruption claims or \$45.3 million for parts of the disruption claim that are still being assessed by DPTI.

Figure 9.1: Utility service relocation costs as at 30 September 2019



* DPTI advised us that on 30 November 2015 the estimated cost for utility services was revised to \$64.9 million.

Significant program overruns occurred across all service types for DPTI delivered works. This resulted in DPTI failing to meet the established service delivery milestones and Gateway South submitting a number of extension of time claims. The financial and time impacts related to the DPTI delivered service relocations include:

- in June 2018 an independent expert determined that Gateway South was entitled to an extension of time of 55 calendar days and delay costs of \$5.3 million
- a Deed of Settlement was executed that resulted in DPTI paying \$6.25 million to Gateway South in October 2018 and extended the contractual completion date from 10 August 2019 to 17 December 2019
- Gateway South submitting a global disruption claim for \$49.3 million of which DPTI has paid \$4 million. The outcome of the rest of the claim is yet to be finalised.

9.2 Findings

9.2.1 Lack of timely reporting on the status of service relocation delivery and emerging issues and risks

Recommendation

For future major projects with significant service relocation works DPTI should ensure that those responsible for overseeing the project are provided with timely, regular, relevant and sufficient information on the progress of service relocation works, emerging issues and risks and actions taken to address them.

Finding

The service delivery team advised us that the main mechanisms used to report matters of concern, emerging issues and risks with DPTI managed utility service relocations were:

- monthly project status reports (a high-level, one-page report for all DUP activities)
- Collaborative Governance Team (CGT) meetings
- weekly project team meetings
- a monthly contract management report for works undertaken by the contractor engaged to relocate water and sewer infrastructure.

We found that the monthly project status reports did not provide DPTI executive and governance groups with detailed information to enable them to effectively consider and assess the status of service relocations, emerging issues/risks and responses to them. We also note the monthly contract management report was provided to the project manager but was not used for reporting to DPTI executive or governance groups to escalate issues.

A May 2017 internal review of the DUP highlighted the need for DPTI and Gateway South to hold a project reset workshop to discuss how the parties would work together to manage remaining service relocations and mitigate impacts to the major works program. Agreed actions from the workshop included forming a team of DPTI and Gateway South officers who were responsible for providing the CGT with weekly progress updates, with any slippages tracked and escalated to the CGT where needed.

Before June 2017 limited reporting was provided to DPTI executive. From June 2017 the service delivery team started to prepare weekly reports on utility service relocations for the project manager, CGT and DPTI executive (including the then Chief Executive). These reports provided detailed information on the risks, mitigation strategies and progress for each of the remaining work packages.

We note that the increased level of reporting to the CGT and DPTI executive started after DPTI had failed to meet contracted milestone dates and after Gateway South had submitted its first extension of time claim. This level of reporting should have been in place earlier in

the project to ensure that those with the ability to make decisions (eg the Chief Executive) were properly informed of emerging issues and risks and could take appropriate actions and make timely decisions to address them.

DPTI response

DPTI accepted the finding and advised that for future Category 1 projects, reporting frameworks and escalation processes will be defined in the revised PMP Standard.

DPTI also noted that:

- CGT reporting applied on a monthly basis and the CGT included DPTI executive representatives. A CGT meeting took place in December 2016, which included a service relocation focus session, due to risks and impacts of late service relocations scope
- monthly project status reports were provided to DPTI executives, including the Chief Executive. The August 2016 report included potential impacts due to late service relocations within the top three risks.

9.2.2 Lack of documented analysis to assess DPTI's ability to deliver works in line with proposed milestone dates

Recommendation

For future major projects with significant service relocation works DPTI should ensure there is robust analysis of its ability to meet proposed milestone dates. The analysis should be documented, consider the risk factors, include appropriate technical advice and consider the likely consequences of not meeting the milestone dates.

DPTI should consider using specialist project managers and contract engineers to assist with complex service relocation works.

Finding

We found that there was a lack of documented analysis before the DUP principal design and construct contract was awarded to Gateway South to assess DPTI's ability to meet the milestones dates set out in the contract.

The contract includes the responsibilities, obligations and rights of DPTI and Gateway South for service relocation works. DPTI established an initial utility service register based on the reference design. The service delivery team advised us that:

- delivery time frames informing milestones were based on previous project delivery experience with the service authorities
- a typical delivery time allowance was applied for the design and construction periods.

During contract negotiations Gateway South amended the register to reflect its assessment of the impact of the service relocations. This assessment formed the basis of the agreed scope of service relocation works required to be completed by DPTI. This agreed scope was included in the DUP design and construction contract and required specific works to be completed by fixed milestone dates.

We sought to understand the analysis of DPTI's capacity to meet the milestone dates, the assessment of risks and the technical advice sought prior to agreeing to the milestone dates in the contract provided by DPTI. DPTI could not provide us with documentation to support the analysis undertaken and/or the advice sought.

Our review of a discussion paper prepared by the service delivery team to identify learnings that could be applied to future service relocation works noted:

- significant changes were made to the utility services register by Gateway South that may have been more strongly contested had DPTI better understood the full delivery and cost impact
- there should have been a more experienced team providing input and reviewing commercial material at the time of the tender.

The paper highlighted that, for future projects, DPTI should consider using specialist project managers and contract engineers to undertake the services relocation work packages which would provide informed and risk focussed input into the development of contract documents.

DPTI response

DPTI advised that it will modify its project management practices for Category 1 projects to improve analysis of the State's ability to meet proposed milestone dates and to meet its delivery timelines in major projects. The analysis will be supported by technical analysis from relevant specialists and include an assessment of risk factors. This will be supplemented by gateway reviews (as required by Infrastructure SA) and/or peer reviews commissioned by DPTI for assurance purposes.

9.2.3 Contract provisions did not enable DPTI to effectively manage the performance of Gateway South

Recommendation

For future projects that require DPTI to deliver utility service relocation works, ensure contractual provisions provide a sound basis for DPTI to manage the performance of contractors and hold them to account for non-performance. For instance, this may include linking services milestones DPTI is responsible for to the provision of the final contractor design.

Finding

Gateway South needed to finalise design packages for works impacted by service relocation works carried out by DPTI. As a result, DPTI needed to effectively manage the performance of activities undertaken by Gateway South to deliver services relocation works within the contracted time frames.

The contract with Gateway South specified milestone dates for service relocations DPTI was responsible for completing. However, it did not contain provisions to enable DPTI to effectively manage Gateway South's performance. The internal review by the services

delivery team found that delays in Gateway South meeting design program deliverables contributed to the service relocation works program overrun.

DPTI delivery milestones not linked to Gateway South design completion

DPTI utility service milestones were not linked to Gateway South design completion in the contract. We were advised by the service delivery team that delays in Gateway South finalising its design of major works impacted DPTI's ability to consider its design and complete its utility services design on time. This resulted in unexpected re-design by DPTI for some work packages to avoid future clashes with Gateway South's design after DPTI's services design had:

- already progressed to 95% or issued for construction (IFC)
- been issued to service authority subcontractors.

For future projects the service delivery team advised us that contracts need to reflect the relationship and interdependencies between the principal construction contract design and DPTI services design. This could be achieved by linking DPTI delivery milestones to the contractor's final design to make them responsible and more accountable and reduce DPTI's exposure to time delays, additional costs and disruption claims.

The intent for the parties to work collaboratively did not eventuate and should have been better reflected in contract arrangements

The contract states that works associated with utility service relocations are to be undertaken by DPTI and Gateway South collaboratively in line with the defined scope of works allocation. The service delivery team advised us that, based on this and previous experience with managing service relocations, DPTI and Gateway South intended to collaborate about target dates and opportunities for shared access of the site to mitigate impacts, but the expected level of collaboration did not occur. We note that the contractual provisions in place were not sufficient for DPTI to be able to enforce this.

DPTI response

DPTI advised that a contract due diligence review requirement will be established for projects to ensure there is a sound basis for performance management and management of other contractual requirements.

9.2.4 Contract provisions did not enable DPTI to effectively manage the performance of service authorities

Recommendation

For future projects that require DPTI to deliver utility service relocation works, contract arrangements should provide a robust mechanism for DPTI to manage the performance of service authorities to reduce its exposure to delay and disruption claims.

Finding

The performance of service authorities can significantly impact DPTI's ability to complete utility service works within required time frames. We found that contracts with service authorities did not contain provisions that enabled DPTI to effectively manage the performance of the service authorities in meeting required milestones. The following commentary describes some specific areas requiring attention by DPTI.

No contractual remedies for service authorities not meeting milestone dates

The service delivery team advised us that service authorities provided programs for some work packages, but they were not updated in some instances or did not reflect the actual dates that the service authority was undertaking work. The team also advised us that DPTI's agreements with service authorities did not require service authorities to provide updated programs or contain appropriate remedies if service authorities did not meet their milestone dates.

We were also advised that the performance of service authority subcontractors was one of the factors that contributed to DPTI not meeting its delivery milestones. This highlights the need for DPTI to have robust contract provisions that it can use to make service authorities accountable for works undertaken by them or their subcontractors.

No requirement for service authorities to review and provide comments on DPTI's design within set time frames

We also noted that DPTI needed service authorities to promptly review and provide comments on its design as it progressed from 30% to IFC. This review is important as the service authorities own the assets being relocated and have established specifications and technical standards. While DPTI requested that service authorities provide comments within two weeks, as there was no contractual time frame for them to respond and they did not always meet this deadline.

DPTI response

DPTI accepted the finding and referred to section 9.2.3 for its proposed actions.

9.2.5 Insufficient time to assess key changes to responsibilities for service relocations

Recommendation

For future procurements DPTI should ensure that sufficient time is available to review the impacts of any changes initiated by contractors or changes proposed to project scope.

Finding

Specific details of the service relocations to be undertaken by DPTI and Gateway South are outlined in the utility services register. The register forms part of the contract documents.

Our discussions with the service delivery team and review of the discussion paper they prepared to identify learnings for future projects noted:

- the utility services register was developed by DPTI during the tender process
- during contract negotiations Gateway South updated the register to include more details
- these changes were difficult for DPTI to reconcile to the initial register to assess and understand the full impact of the changes
- Gateway South's changes increased DPTI's responsibility for service relocations and subsequently formed part of the final contract after being accepted by DPTI.

The service delivery team advised us that DPTI should have allowed more time to properly understand and review the late changes by Gateway South before contract award.

We also noted that one of the main reasons for the delays in DPTI delivered service relocations was the scope increase to extend the motorway by one kilometre. It resulted in DPTI being required to undertake additional service relocations. The service delivery team advised us that minimal planning for service relocations in these areas had been undertaken by DPTI at that time.

DPTI should have ensured that enough time was made available to review and assess the impact of the changes put forward by Gateway South and the revised project scope on the utility service relocation works before agreeing to the milestone dates specified in the contract.

DPTI response

DPTI noted the finding.

9.2.6 Lack of contract management plans for works undertaken by service authorities and a contractor

Recommendation

For future projects with significant contracts DPTI should ensure that a contract management plan is developed before the contracts are executed. The plan should include processes to monitor and report on compliance with key contract deliverables.

Finding

DPTI had to promptly complete service relocations within contracted time frames to enable major works to start on time. Meeting these time frames was important to reduce the risk of delays to project completion and delay costs and required DPTI to effectively manage the performance of service authorities and contractors.

We found that DPTI did not have an overarching contract management plan for works by service authorities. It also did not have a contract management plan for the contractor that it engaged to complete some of the more significant service relocation works to relocate water and sewer mains. The contract sum for those works was about \$35 million.

The service delivery team advised us that weekly team meetings were used to identify key tasks and assign responsibilities. In these meetings the design manager provided design updates and key actions for each utility were discussed.

We were also advised that the contractor DPTI engaged developed plans related to its contract deliverables, including a project management plan, quality management plan and construction management plan. We note that these documents were not prepared by DPTI and do not address the specific elements of a contract management plan.

DPTI response

DPTI advised it agrees that a contract management plan is good practice and should be developed consistent with the relevant acquisition plan at an appropriate stage in the procurement process. Accordingly, DPTI will set out the framework for the process, structure, content and approval process for:

- the development of revised contract management plans in Category 1 projects for contracts determined to be material (the revised CMP Standard)
- the related monitoring and reporting requirements.

9.2.7 Integrated utility services program used to manage and monitor the progress of works was not developed timely

Recommendation

For future projects where DPTI is responsible for delivering part of the project works it should ensure that tools used to monitor and manage the progress of the works are established timely.

Finding

Most of the service relocations were programmed as early works by DPTI. They were on the critical path of the DUP and if delayed had the potential to cause significant impact to the main construction program and project cost.

The service delivery team advised us that an integrated utility services program was the main tool DPTI used to monitor and manage the progress of service relocation works. The integrated program is a scheduling tool that has milestones for each work package.

DPTI updated the services program monthly and provided it to Gateway South to integrate into its construction program. Gateway South maintained two programs, one being the program provided in the contract and the other an adjusted program to incorporate DPTI service relocation milestones.

We found that DPTI did not implement the service program tool timely or promptly obtain Gateway South's adjusted program to assess the impact of DPTI's works to the DUP construction program.

DPTI developed a draft program that included scheduled dates for SA Power Networks, Telstra and APA⁵⁵ work packages and sent this to Gateway South on 12 August 2016. This information:

- informed Gateway South and DPTI of the various sequencing and staging activities within the service relocation packages that DPTI had started or planned to undertake
- was used to help identify an aligned critical path and agree where efficiencies and clashes may exist within the current schedule.

DPTI provided an updated program to Gateway South on 13 December 2016. In response, on 16 December 2016 Gateway South provided DPTI a draft version of a construction program that included revised decommissioning dates for remaining DPTI service relocations. It was provided to DPTI to discuss the options available to the project to reduce any impacts to the contractual completion date. We noted that when Gateway South provided the draft program, DPTI had already undertaken significant service relocation works and that fixed milestone dates for DPTI to complete certain works had either already passed or were due within the next three weeks.

DPTI response

DPTI accepted the finding and advised it has now established protocols for reporting on the DUP and other Category 1 projects to its newly established governance committees, and the requirements are included in the approved governance plan. Protocols for regular reporting and escalation to governance committees will be incorporated into the revised PMP Standard for all Category 1 projects.

DPTI also clarified that after providing the DPTI utility services program to Gateway South on 12 August 2016, further revisions were provided to them on 30 September 2016, 7 October 2016 and 1 November 2016, and intermittently thereafter.

9.2.8 Lack of documented analysis to assess the impact of a large contract variation on service relocation works

Recommendation

For significant project delivery decisions DPTI should ensure that detailed analysis is documented and provided to decision-makers to demonstrate that it has properly considered, assessed and evaluated key risks and issues.

⁵⁵ APA is an entity that owns, operates and manages energy assets including natural gas infrastructure.

Finding

Before 2016 all of Gateway South's design was based on scheme 2B, including its assessment of the impact to utility services and advice to DPTI about alignment and potential clashes with its works.

In May 2016 DPTI issued a contract variation instructing Gateway South to design and construct the works in line with revised traffic volumes (ie scheme 2D). The decommissioning approval dates for DPTI service relocation works were extended by 126 calendar days as a result of the decision to proceed with scheme 2D.

The service delivery team advised us that at the time the need to revise the design of the major works was identified, the design for service relocations between Flinders Drive and Mimosa Bridge had already reached IFC and construction works had started on the common service trench. Further, while redesign was being undertaken the contractor constructing the common services trench had to cease works.

We found that there was a lack of documented analysis of the impact of the scheme 2D variation on DPTI utility service relocations, including DPTI's ability to meet the contracted delivery milestones.

We also note the service delivery team advised that the contract variation for scheme 2D failed to acknowledge the significant risk of changes to Gateway South's design and subsequent impacts on already established IFC design and advanced design alignments for DPTI service relocations. They further noted that if this risk had been properly assessed, the opportunity to include changes to DPTI services delivery milestones could have formed part of the scheme 2D contract variation negotiations.

DPTI response

DPTI advised that the revised contract management plan will detail escalation processes for Category 1 project delivery decisions, including contract variations.

It also advised that protocols for regular reporting and escalation to governance committees will be included in the revised PMP Standard for all Category 1 projects.

10 Financial management

What we found

DPTI has implemented financial management and reporting arrangements for the project but there was a need to improve in some areas. This included:

- shortcomings in arrangements to control and provide visibility over the use of contingency funds, including authorisation requirements, logging drawdowns and detailed reporting
- the adequacy of the project budget and remaining contingency was not formally reviewed when significant expenditure commitments for unanticipated scope changes and variations occurred
- the need to provide senior management and those charged with governance with more detailed budget information to improve transparency and accountability for financial outcomes
- thresholds for escalating financial issues were not defined.

What we recommended

We recommended DPTI:

- align authorisations for using contingency funds with the current project governance and organisational structure
- establish a log itemising drawdowns from the project contingency, and produce detailed reporting on how contingency funds have been allocated
- formally review the adequacy of the project budget as soon as significant cost pressures materialise and implement strategies to address them
- review what financial information senior management and those charged with governance need to fulfil their responsibilities. Also, consider implementing more detailed financial reporting to improve transparency and accountability for financial performance and facilitate better decision-making
- document thresholds for escalating financial decisions to ensure that significant financial issues are reported to those charged with governance. These thresholds should be based on materiality and risk and communicated to staff.

10.1 Introduction

Financial management is a critical component of project management.

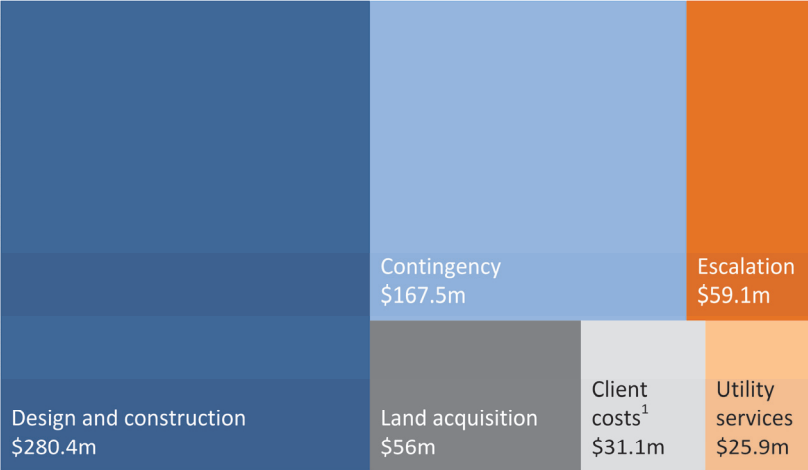
As at 30 September 2019, the DUP is forecast to exceed the revised project budget of \$667 million by \$53 million and the contingency will be fully used. As it nears completion and

risks materialise, exercising strict financial management controls becomes increasingly important to ensure that funds are prudently spent within approved limits and for appropriate purposes.

Project budget

The original project budget was \$620 million. Figure 10.1 shows the composition of the original project budget at a high level.

Figure 10.1: Original budget key categories



¹ Includes project management, community and stakeholder engagement, environmental and other sundry costs.

The current project budget is \$667 million.⁵⁶ DPTI advised that an updated baseline budget broken down by key cost categories is not reported as part of DPTI’s project reporting practices.

For a large, high-value project like the DUP, it is good practice to establish a baseline budget broken down by key cost categories. This baseline enables a point of comparison to measure actual performance for different cost areas against. The initial budget estimates for key cost categories may need to be updated once major contracts are awarded or for other circumstances such as the reallocation of budget funds or release of project contingency for specific purposes. Where this occurs, the baseline should be revised once changes to the project budget are approved.

Monitoring and controlling the use of contingency funds

The project contingency is a sum of money from the project budget set aside to cover the cost of:

- unplanned activities
- risks arising from delivering project outcomes that require additional funds.

⁵⁶ On 18 November 2019 the Commonwealth and SA Governments announced additional funding for the DUP of \$87.5 million to increase total funding for the project to \$754.5 million. The project budget of \$667 million has not been amended in our Report to reflect the impact of this additional funding.

The original project budget included a sizeable contingency (\$167.5 million), representing 27% of the project budget (see figure 10.1).

The contingency is generally not intended for changes to project scope outside the business case for which the investment was approved. The contingency is there to be called upon if needed, but if it is not needed it should be reinvested into other projects that need the funds.

Part of the project contingency was held centrally by the Department of Treasury and Finance. It was released in full in November 2015 to deliver the motorway scope extension.

To ensure that the project contingency is only used for its intended purpose, it is important that there are processes to:

- control and authorise the release of contingency funds when a contingent risk materialises
- monitor contingency use and performance within approved limits
- transparently report on contingency performance to enable effective governance and decision-making.

In late 2017, DPTI established a Contingency Management Framework (CMF) to standardise procedures for managing contingency funds across various stages of the project lifecycle and defines the governance framework over these processes.

Monitoring and reporting on project expenditure

Effective monitoring of project financial performance includes providing management and those charged with governance with sufficiently detailed financial information appropriate to their level of responsibility. This is so that they can properly interrogate and challenge this information and make sound financial decisions.

This information should include:

- actual project expenditure to date and forecast cost at completion
- cost variations, causes and consequences
- risks and issues impacting on the project budget.

DPTI has established various tiers of financial reporting to monitor the DUP at a project and portfolio level.

The Senior Responsible Officer is defined in the DUP project management plan as being the ultimate single point of accountability and having responsibility for project outcomes. This includes financial outcomes. Additionally, as noted in section 5.1.3, DPTI has implemented governance structures and arrangements to oversee the DUP, with several different governance groups being responsible for oversight during the project delivery phase. We note that in July 2019 the Finance and Investment Committee was established, with a dedicated focus on financial management and controls.

10.2 Audit approach

We assessed whether DPTI established appropriate budgetary and financial management and reporting arrangements for the DUP.

For this review, we considered the DPTI Project Management Framework, DPTI Contingency Management Framework, Infrastructure NSW Contingency Management Guidebook and other best practice principles.

10.3 Findings

10.3.1 Change to project scope and contract variations in the early stages of the project put pressures on the project budget

Recommendation

DPTI should formally review the adequacy of the project budget as soon as significant cost pressures materialise and identify and implement strategies to address cost pressures.

It should document the analysis performed and decisions made.

Finding

Significant expenditure commitments for unanticipated scope changes and contract variations made early in the project lifecycle consumed a significant proportion of the project contingency. This limited the project budget's ability to cater for risks arising in the project delivery phase

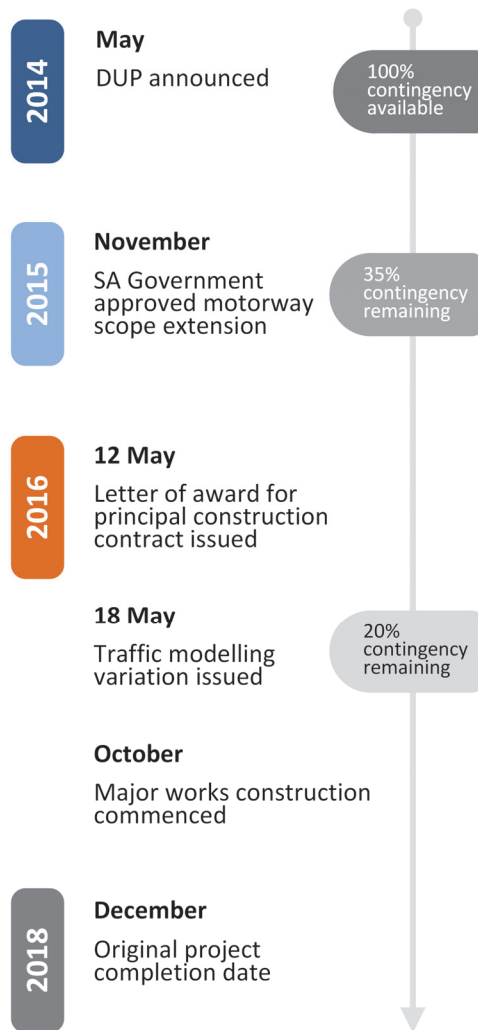
We found DPTI did not undertake a formal analysis of the adequacy of the project contingency when the decisions were made to extend the motorway by one kilometre (see section 2.2.3.1) and issue the traffic modelling variation (see section 7.3.1).

The original \$620 million project budget included a \$167.5 million⁵⁷ contingency (ie 27% of the original project budget). 80% of the project contingency was used before major works construction commenced. The remaining project contingency was insufficient to cover commercial claims and other risks arising in construction, resulting in an increase in the project budget to \$667 million in October 2018.

Figure 10.2 shows the timeline of events and impact on the project contingency.

⁵⁷ Includes \$29.97 million contingency held centrally by the Department of Treasury and Finance.

Figure 10.2: Timeline of significant events impacting the project contingency



DPTI advised that it expected that the project (including the motorway extension and traffic modelling variation) could be delivered on budget with the reduced contingency. We found, however, there was no documented analysis to support this position. We consider that, given the significant reduction in the available project contingency, it would have been financially prudent to review the adequacy of the project budget and remaining contingency to complete the project including identifying specific strategies to address budgetary pressures (ie scope reductions, increase budget).

Without a formal review, strategies to address cost pressures may not be identified and implemented timely which may result in the project exceeding the approved budget.

DPTI response

Project scope issues are now addressed by the newly formed MPEC and FIC as required.

For future Category 1 projects, the revised PMP Standard and CMP Standard will incorporate project governance requirements, including escalation processes to address cost pressures.

10.3.2 Those responsible for overseeing the project do not monitor project expenditure against budget for key cost categories

Recommendation

DPTI should review what financial information management and those charged with governance need to fulfil their responsibilities.

DPTI should consider implementing more detailed financial reporting to senior management and those charged with governance to improve transparency and accountability for financial performance and facilitate better decision-making.

Finding

We found that those responsible for overseeing the project do monitor project expenditure against the total budget. The effectiveness of this review would be improved, however, by monitoring project expenditure against budget at a more detailed level. This could be done by monitoring expenditure for key cost categories as illustrated in figure 10.3.

Figure 10.3: Illustrative example of detailed project expenditure reporting

	Budget \$'million	Actual ITD ⁵⁸ \$'million	Forecast to complete \$'million	Variance forecast to budget \$'million
Client costs	x	x	x	x
Planning, design and investigation	x	x	x	x
Land acquisition	x	x	x	x
Utility services	x	x	x	x
Construction (minor works)	x	x	x	x
Construction (major works)	x	x	x	x
Contingency	x	x	x	x
Total	667	x	x	x

Monitoring and reporting of project expenditure against a baseline budget broken down by key cost categories would improve the effectiveness of budget management and enhance accountability and transparency by:

- holding individuals to account for budget variances in cost categories that they are responsible for
- providing those responsible for overseeing the project with better visibility over financial performance for key cost areas, enabling them to identify and focus on cost categories with substantial deviation from budget amounts
- enabling management to better identify underlying causes and effects of budget variations (including the reliability of original budget estimates and planning assumptions), and develop suitable actions to manage variations

⁵⁸ Inception to date.

- helping management to prioritise resources to address areas that may have the greatest impact on achieving budget outcomes.

We note that DPTI is currently revising its governance framework and has established a new FIC. As part of this governance review, it is timely for DPTI to reflect on what level of detail management and those charged with governance need (including financial information) to fulfil their responsibilities.

In the absence of monitoring and reporting project expenditure against a baseline budget broken down by key cost categories there is a lack of transparency and accountability for project activities with cost overruns. Further, significant variations between actual/forecast project expenditure and project budget for key cost categories may not be identified and understood, and actual/forecast project expenditure against project budget may not be effectively managed.

DPTI response

DPTI has established new governance committees MPEC and FIC. A reporting mechanism (on an exception basis) will be established, where significant variances that have been identified between actual/forecast project expenditure and project budget for appropriate cost categories will be escalated to the relevant governance group.

For future Category 1 projects, the revised PMP Standard and CMP Standard will incorporate these requirements, including the process for escalation.

10.3.3 Opportunity to improve project financial information by comparing budget information for key cost categories

Recommendation

DPTI should consider establishing a baseline budget broken down by key cost categories and monitor and report on project expenditure against this baseline at a cost category level.

Finding

We found there was scope to improve project financial information prepared by the corporate finance branch (Business Finance) for a more detailed and transparent view of budget performance.

We recognise that Business Finance, with the assistance of the project team, maintains a detailed worksheet that tracks actual and forecast project expenditure information with costs categorised and itemised in detail. In this worksheet, total actual and forecast costs are compared to the total project budget, however a comparison between actual and forecast costs and baseline budget broken down by key cost categories is not prepared. Therefore, it is not clear which cost categories are contributing to budget variances and the magnitude of their impact.

Preparing detailed budgetary analysis would enable Business Finance to identify specific cost categories with overruns or other matters of concern and bring them to the attention of management and those charged with governance. It would also facilitate preparing detailed budget reporting as outlined in section 10.3.2.

We note that separate detailed budget monitoring was carried out for property acquisitions and service relocation cost categories, however separate detailed monitoring of these areas has stopped as these activities are substantially completed. Monitoring of these cost categories now forms part of the overall project budget monitoring activities described above.

DPTI response

DPTI accepted the finding and referred to its response in section 10.3.2 for its proposed action.

10.3.4 Governance arrangements over management of contingency funds were not clearly defined

Recommendation

DPTI should establish authorisations for the release and use of contingency funds with consideration to the current project governance and organisational structure. Authorisation processes should be consistently documented in guidelines and procedures.

DPTI should communicate authorisation requirements to staff and promulgate the CMF.

Finding

The CMF outlines the need for delegations of authority to regulate the use of contingency funds to effectively control them. Without clearly defined governance arrangements, there is a risk that contingency funds are not used effectively and the project may not be delivered within the approved budget.

We noted that governance arrangements over the management of contingency funds are not clear, including:

- inconsistencies between the CMF, organisational procedures and the project management plan regarding who is authorised to release and use contingency funds internally
- positions of authority stated in the CMF do not reflect the current organisational structure and governance arrangements.

Further, the CMF has not been made available to staff on the Project Management Framework intranet site.

DPTI response

DPTI introduced a CMF in 2017 to formalise the management of contingencies in Category 1 projects. It will review the CMF to align it with recent changes to organisational structure and governance to integrate with requirements set out in the revised PMP Standard and CMP Standard.

10.3.5 A log of drawdowns and adjustments to the project contingency was not established

Recommendation

DPTI should establish a log itemising approved drawdowns from the project contingency and adjustments to contingency levels, together with reasons and details of who approved the changes.

The log should be integrated with project change processes to ensure that the impact of all project changes that have a cost impact on the project contingency are considered and recorded on the log.

Finding

A log itemising approved drawdowns from the project contingency and adjustments to contingency levels (ie release of contingency funds held centrally by the Department of Treasury and Finance) has not been established.

Establishing and maintaining a detailed log would improve the transparency of specific events impacting the contingency and provide an audit management trail of the reasons and associated approvals.

The log would also provide a single source of truth to identify how much contingency is remaining and enable management to assess whether:

- all risks with a cost impact have been factored into the project contingency
- the remaining contingency is sufficient to complete the project.

The log would help with preparing detailed reporting on the project contingency discussed in section 10.3.7.

DPTI response

DPTI accepted the finding and referred to its response in section 10.3.4 for its proposed action.

10.3.6 Contingency reporting not implemented from project inception

Recommendation

For future projects DPTI should implement reporting on contingency levels from project inception.

Finding

To enable effective contingency management, regular reporting on contingency performance to management and those charged with governance is essential to provide visibility and transparency of financial and risk information.

Contingency reporting to the PRP started in January 2018 following the introduction of the CMF and after most of the contingency had been used.

Before this there was no separate reporting on the status of the project contingency to management or those charged with governance.

It is sound practice to report on contingency levels from project inception. This would have given management and those charged with governance visibility over the material financial impact of events that drastically reduced contingency funds early in the project and an opportunity to better respond to the financial impact of these events on the project budget.

DPTI response

DPTI accepted the finding and referred to its response in section 10.3.4 for its proposed action.

10.3.7 Detailed contingency reporting was not prepared

Recommendation

DPTI should implement reporting on the project contingency status with detail on how contingency funds have been allocated/committed.

Finding

Current reporting on the contingency status is high level and does not detail the value and nature of items that have been allocated/committed against the contingency fund.

Reporting detailed contingency information would enable those charged with governance to better monitor and understand the use of contingency funds and overall project budget by providing transparent disclosure of:

- contingency performance against baseline (ie the approved project contingency)
- what contingency funds are being used for and associated project risks.

Without detailed contingency reporting, it is possible that inappropriate use of contingency funds is not detected (ie for purposes outside the agreed project scope), and ineffective management of the project contingency resulting in project expenditure exceeding the approved project budget.

DPTI response

DPTI accepted the finding and noted that a summary of major project contingencies remaining is now prepared monthly, along with key issues and assumptions.

Further, it will review current reporting processes to identify areas for improvement as part of its review of the CMF.

10.3.8 Thresholds about when to escalate financial issues were not defined

Recommendation

DPTI should establish and document thresholds for escalating financial issues with consideration to materiality and risk.

Escalation thresholds and related procedures should be communicated to the project team.

Finding

Thresholds for when to escalate financial issues to those charged with governance are not defined. It is therefore not clear if or when financial issues are significant enough to be brought to their attention, and who the issues should be reported to. As a result, significant financial issues may not be reported to those charged with governance for actioning or attention.

DPTI response

DPTI accepted the finding and referred to its response in section 10.3.1 for its proposed action.

10.3.9 Discrepancies in financial information in monthly project status reports

Recommendation

DPTI should review quality assurance processes to ensure that financial information presented in monthly project status reports is accurate and consistent.

DPTI should implement an independent checking process to ensure that figures input into the monthly project status report are accurate.

Finding

DPTI's project management reporting tool summarises project information including project financial status. Reports from the tool (monthly project status reports) are generated based on financial data input by the project manager and Business Finance, and used by senior management and governance committees to monitor whether the DUP is on budget.

We noted inaccuracies and inconsistencies in the financial information in monthly project status reports from August 2017 to July 2018.

There were various causes of these discrepancies, including:

- forecast costs reported in different sections of the report being prepared on different bases (ie worst case scenario versus most likely scenario)
- a typographic error
- a system limitation resulting in financial information not been rolled over correctly between financial years.

Incorrect financial information may result in financial problems not being detected and adversely impact the quality of financial decisions made.

DPTI response

DPTI will review quality assurance processes in reporting financial information presented in the monthly project status reports.

10.3.10 Traffic light status in monthly project status reports did not accurately convey the project's financial status

Recommendation

DPTI should ensure that the traffic light status in the monthly project status reports accurately conveys the financial status of the DUP.

Finding

It is important that the financial status of the project is accurately conveyed to management and those charged with governance to bring financial issues to their attention and enable corrective actions to be implemented in a timely manner.

The traffic light status used in the monthly project status reports did not accurately convey the project's financial status for a period of time. From August 2017 to November 2017 final project expenditure was forecast to exceed budget (ranging from \$12 million to \$16 million), however the project financial status was not escalated to red until December 2017 when the forecast to budget variance increased to \$32 million.

The PMO Tool User Guide states that project expenditure should be reported as red if at least one of the following two elements are predicted:

- financial risks are present and have not been mitigated which may result in the project exceeding the allocated project budget (including contingency)
- predicted final project expenditure will result in the project exceeding the allocated project budget (including contingency).

An internal review of capital project financial reporting for several projects (including the DUP) also identified that the traffic light system did not present an accurate picture of the financial state of the project.

DPTI response

DPTI has provided additional guidance and assistance to project managers.

10.3.11 Inadequate documentation to support reliability of project forecast costs

Recommendation

DPTI should maintain records to ensure that project forecast costs are adequately supported including documentation of any significant assumptions.

Finding

We performed detailed testing over project forecast costs as at 30 April 2019 and sought to confirm the reliability of the project forecast by reconciling it to supporting documents.

The project team could not provide supporting documentation to substantiate the basis for calculating certain forecast amounts. We also noted that the significant judgements and assumptions used to determine the timing and amount of project forecast costs were not documented.

Without adequate documentation to support the reliability of forecast costs there is a risk that incomplete or inaccurate forecast information is included in finance reports.

DPTI response

DPTI accepted the finding and advised it has now implemented version control to address the issues identified by Audit.

11 Benefits realisation

What we found

Robust benefits realisation processes to define, monitor, measure and report on the achievement of project outcomes were not established. This included:

- a benefits realisation plan outlining how benefits will be realised, monitored, managed and evaluated was not established
- baseline and target measures were not defined for all relevant benefits to enable the achievement of benefits to be measured
- a benefits tracking tool was not established to centrally track and monitor the achievement of benefits
- benefits were not agreed and signed off by benefit owners
- quality assurance activities were not performed to validate the integrity of benefits
- there was no ongoing monitoring and reporting of project benefits.

What we recommended

Proper benefits realisation management must happen throughout the project lifecycle to achieve desired project outcomes and demonstrate the merit of the project. This focus is particularly important as the DUP nears completion and some of the more significant expected benefits, such as operational efficiencies, come to fruition. We recommended DPTI:

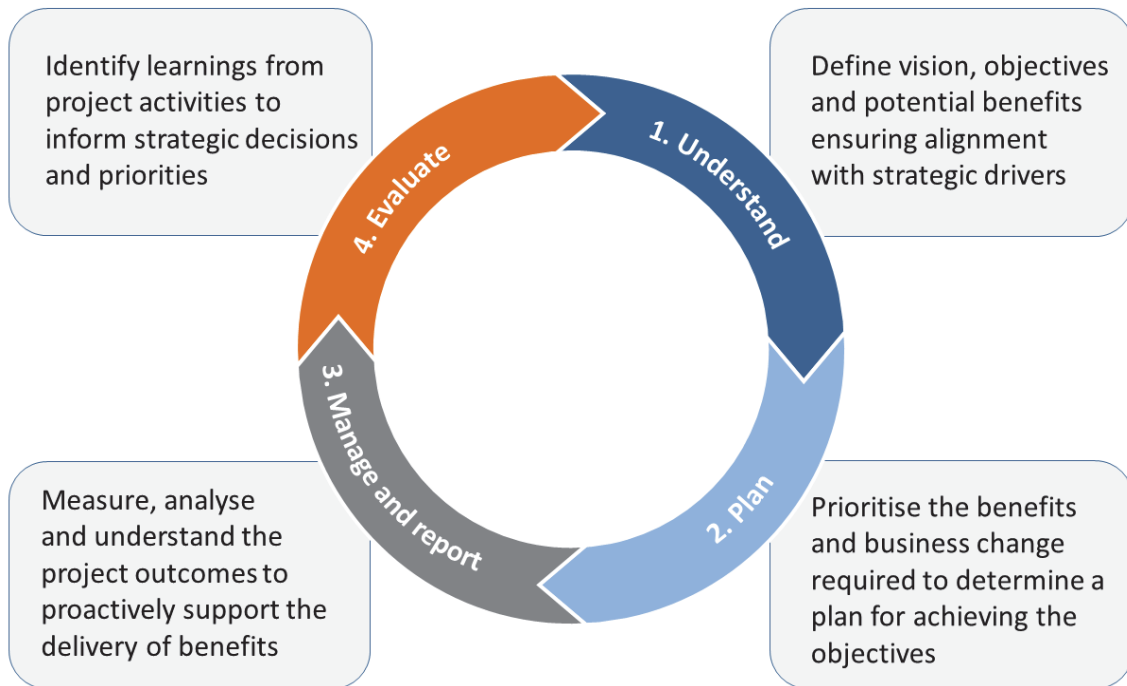
- continue to develop and implement a benefits realisation plan for the DUP and, for future projects, implement a benefits realisation plan from project inception
- define baselines and targets for all relevant measures
- establish a benefits tracking tool to centrally track and monitor the progress of benefits throughout the project and beyond completion
- ensure all benefits are agreed and signed off by benefit owners
- for future projects, implement quality assurance processes to validate the integrity of benefits
- implement mechanisms to monitor and report on benefits throughout the project and beyond completion.

11.1 Introduction

While a sound business case to justify investing public money in a project like the DUP is important, it is equally important to ensure that the intended benefits of the DUP set out in the business case are achieved.

Benefits realisation management is the process of identifying, planning, managing and evaluating the intended benefits of the investment. Figure 11.1 summarises the four phases of benefits realisation management as set out in DPTI’s Benefits Realisation Management Framework.

Figure 11.1: Benefits realisation phases



It is important that DPTI gives focus to benefits realisation management as the project nears completion and some of the more significant expected benefits, such as operational efficiencies, come to fruition.

We are aware that DPTI is working on improving benefits realisation management across the organisation.

DPTI’s Benefits Realisation Management Framework sets out the minimum requirements for the successful implementation of benefits realisation management. They are shown in figure 11.2.

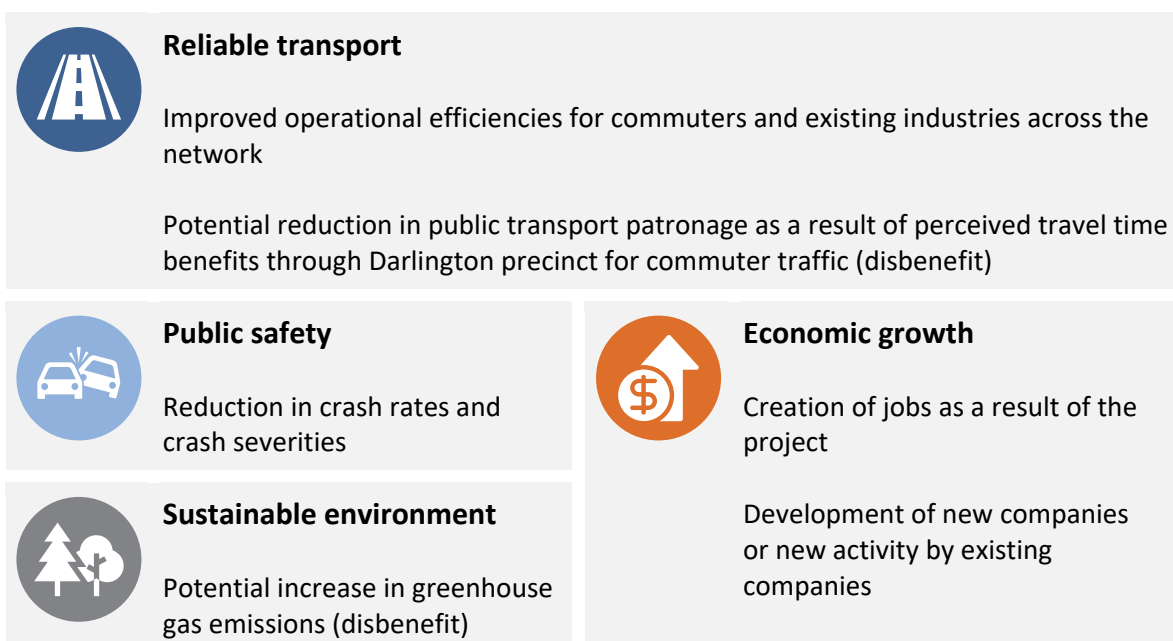
Figure 11.2: Benefits Realisation Management Framework – minimum requirements

Business rule	Purpose
Single points of accountability must be assigned for the realisation of each anticipated benefit.	Once the business case is approved, benefit owners must be appointed to ensure projects are progressed successfully and that the expected benefits are actually realised.
Baseline measures must be taken for all tangible benefits at the earliest opportunity.	The baseline provides an independent and credible position with assumptions to demonstrate that benefits have been delivered as proposed.

Business rule	Purpose
Benefit profiles must be developed for each individual benefit identified using the benefit profile template.	This will ensure that DPTI undertakes a complete assessment of the benefit properties.
A consolidated benefits realisation plan must be developed for the project outlining how and when benefits will be realised.	This will ensure that all the tasks and actions that have to be undertaken to achieve the claimed benefits for the project are considered and recorded.
A benefits realisation register must be established and updated on a monthly basis.	The progressive achievement of benefits must be tracked throughout the life of the project and beyond completion.
A change control procedure that includes an assessment of impact on benefits must be established.	All changes should be fully assessed through the change control process to determine the impact on the expected benefits or benefit assumptions, prior to being approved by the benefit owner to ensure that benefits are not compromised.
Benefits realisation must be considered as a key component of project delivery and adequately resourced.	Project managers must apply the same standards of management and resourcing to benefits realisation as they would to any other element of the project (such as scheduling, risk management, quality assurance, etc).

Figure 11.3 captures the expected project benefits/disbenefits identified by DPTI in the DUP benefit profiles.

Figure 11.3: DUP benefit categories and descriptions





Efficient operations

Reduced operating costs resulting from delivery of new infrastructure

Improved engagement relationships with utility service providers

Improved engagement and reporting relationships between Commonwealth, State and local government stakeholders



Active and connected communities

Increased participation in active modes of transport (eg cycling)



Accessible opportunities

Industry participation to promote Aboriginal and Torres Strait Islander employment

11.2 Audit approach

We assessed whether DPTI established benefits realisation arrangements including processes to identify, measure, report and monitor the project's intended benefits.

For this review we considered DPTI's Benefits Realisation Management Framework and the NSW Benefits Realisation Management Framework.

11.3 Findings

11.3.1 Benefits realisation plan has not been established

Recommendation

DPTI should continue to develop and implement a benefits realisation plan for the DUP.

For future projects, DPTI should implement a benefits realisation plan from project inception.

Finding

At the time of our review, benefit profiles were developed for identified project benefits/disbenefits, however a benefits realisation plan outlining how benefits will be realised, monitored, managed and evaluated in a single document was not established. Developing a consolidated benefits realisation plan is a requirement of the DPTI Benefits Realisation Management Framework.

Without a structured and coordinated benefits realisation plan the DUP may not successfully achieve project outcomes and the merit of the investment cannot be demonstrated.

The absence of a benefits realisation plan was also identified in a review performed by McGrathNicol on behalf of the Commonwealth in August 2018.

Since we started our review, the PMO has started a project to produce a standard benefits management plan template and document a process to apply the plan over the project lifecycle. A resource has also been assigned to develop a benefits realisation plan for the DUP.

DPTI response

DPTI will complete the documentation of a Benefits Realisation Management Framework for all Category 1 projects. It will set out in a single document how the benefits will be measured, defined, realised, managed, validated and evaluated. It will also describe the roles, responsibilities and accountabilities in relation to the Benefits Realisation Management Framework.

11.3.2 Baselines and targets have not been defined for all relevant benefits

Recommendation

DPTI should define baselines and targets for all relevant measures.

Finding

Baselines and target measures have not been defined for all relevant benefits to:

- enable the achievement of benefits to be measured
- demonstrate that the project/investment has delivered the value proposition in the business case.

DPTI response

DPTI accepted the finding and referred to its response in section 11.3.1 for its proposed action.

11.3.3 A benefits tracking tool should be established

Recommendation

DPTI should establish a benefits tracking tool to centrally track and monitor the progress of benefits throughout the project and beyond completion.

Finding

We found that a benefits realisation register was not established in line with DPTI's Benefits Realisation Management Framework to assess whether the project is on track to achieve all intended benefits. Consequently, underperformance may not be detected and corrective actions implemented in a timely manner, and the project may not successfully achieve its outcomes.

The PMO advised that benefits are tracked through various means and by different areas across the organisation.

Establishing an integrated register that tracks each benefit's progress towards realisation targets would enable the achievement of benefits to be centrally tracked and monitored throughout the project and beyond completion.

DPTI response

DPTI accepted the finding and referred to its response in section 11.3.1 for its proposed action.

11.3.4 Benefits were not signed off by benefit owners

Recommendation

DPTI should ensure all benefits are agreed with and signed off by benefit owners.

Finding

Individual benefits were not signed off by benefit owners.

It is sound practice for benefits to be signed off by benefit owners to assign accountability and responsibility to those who are ultimately responsible for the realisation of benefits.

Benefits should be validated by benefit owners and sign-off obtained to confirm that the benefits are realistic, target values are achievable and get the agreement of benefit owners.

DPTI response

DPTI accepted the finding and referred to its response in section 11.3.1 for its proposed action.

11.3.5 Benefit owners do not reflect the current organisational structure

Recommendation

DPTI should update benefit profiles to reflect current benefit owners.

Finding

Benefit owners provide a single point of accountability for the realisation of individual benefits. Benefit owners defined in benefit profiles are outdated and do not reflect the current organisational structure. Without up-to-date benefit owners, there is lack of clarity as to who is accountable and responsible for benefits realisation and the project may not successfully achieve project outcomes.

DPTI response

DPTI accepted the finding and referred to its response in section 11.3.1 for its proposed action.

11.3.6 Quality assurance activities have not been performed to validate the integrity of benefits

Recommendation

For future projects, DPTI should implement quality assurance processes to validate the integrity of benefits, with consideration to alignment with project objectives.

Finding

Quality assurance activities were not performed to validate the integrity of identified benefits.

Quality assurance processes would help validate that identified benefits are:

- genuine benefits linked to the objectives of the project (as opposed to performance indicators)
- realistic and measurable (including the integrity of baselines, targets and measurement methods).

Benefits must be measurable and evidence-based to demonstrate value. If benefits are not measurable, then insufficient evidence exists to justify the investment in the project.

DPTI response

DPTI accepted the finding and referred to its response in section 11.3.1 for its proposed action.

11.3.7 No ongoing monitoring and reporting of project benefits

Recommendation

DPTI should implement mechanisms to monitor and report on benefits throughout the project and beyond completion.

Finding

There was no ongoing monitoring and reporting of all project benefits.

We note that it may not be practical to report on some benefits, given their nature, until the project is completed (eg improvements in crash rates and travel times cannot be measured until the infrastructure is completed and operational). However, certain benefits can be

measured and monitored progressively throughout the project to give management confidence that benefits realisation is on track and enable any corrective action needed to be taken as soon as possible. These benefits include:

- the number of FTE jobs created annually
- the percentage of contractors employed during construction from the Southern Adelaide area
- the percentage of Aboriginal and Torres Strait Islander employment during construction.

While there is some self-reporting provided by Gateway South relating to the Industry Participation Policy, these measures are different to the project benefits and do not reflect total project outcomes.

In the absence of regular monitoring and reporting of benefits, underperformance may not be detected and corrective action implemented in a timely manner to successfully achieve project outcomes.

DPTI response

DPTI accepted the finding and referred to its response in section 11.3.1 for its proposed action.

Appendix 1 – Chronology of events for the DUP

Date	Event
2014	
13 May	The Commonwealth and SA Governments announce a joint funding commitment of \$620 million to construct the DUP.
June	Initial concept design released for public comment.
2015	
29 March	Alternative design scheme released for further consultation.
24 September	PWC tables its final report on the DUP and recommends that the project proceeds.
6 October	North-South Corridor Project Governance committee established.
30 November	SA Government approves: <ul style="list-style-type: none"> the Minister for Transport and Infrastructure entering into a contract with Gateway South to design and construct the DUP an increase to the DUP scope of works to extend the motorway by a further one kilometre to the north past Tonsley Boulevard.
20 December	The Commonwealth and SA Governments announce the motorway scope extension. DPTI advises Gateway South that it is the preferred tenderer and is required to undertake design development works to enable the contract to be executed, and can also start site investigations.
2016	
12 May	DPTI issues a letter of award to Gateway South for design and construct of the DUP.
18 May	DPTI instructs Gateway South to complete the traffic modelling variation.
5 July	Category 1 High Value, High Risk Project Steering Committee established.
31 August	DPTI and Gateway South execute a formal instrument of agreement for design and construct of the DUP. DPTI advises GHD that it is the preferred tenderer for construction verifier services.
12 October	Construction of major works commences. ⁵⁹
21 December	DPTI issues a letter of award to GHD for construction verifier services.
2017	
14 February	DPTI and GHD enter into a formal instrument of agreement for construction verifier services.
5 May	Gateway South submits a claim for an extension of time and delay costs arising from the non-completion of a water main between Flinders Drive and Sturt Road.
29 June	Gateway South submits a claim for extension of time and delays costs arising from the relocation of utility services.

⁵⁹ DPTI 2017, *North-South Corridor Darlington Upgrade, PMO monthly status report – September 2017*.

Date	Event
25-26 November	The first of two bridges on Main South Road over the Southern Expressway is installed.
2018	
19 June	Expert determination for the claim relating to relocation of utility services determines that Gateway South is entitled to an extension of time of 55 days and delay costs of \$5.3 million.
23 July	Main South Road bridge over the Southern Expressway to surface roads opens to traffic.
7 September	Northern section of the Ayliffes Road bridge is installed.
11 October	Deed of Settlement executed for a second claim relating to the relocation of utility services. DPTI pays Gateway South \$6.25 million and amends the contractual completion date to 17 December 2019.
19 October	Gateway South submits a global disruption claim relating to the relocation of utility services for \$32.1 million.
22 October	New DPTI Chief Executive commences.
29 October	SA Government approves the reallocation of \$47 million in savings from current and completed Commonwealth and SA Government funded projects to the DUP to address cost pressures. The project budget is revised from \$620 million to \$667 million.
2019	
2 May	Defects are first observed in the surface of the revetment wall on the lowered motorway between Sturt Road and Flinders Drive.
5 May	A section of the revetment wall slumps.
8 May	A second section of the revetment wall slumps. DPTI engages a specialist engineering consulting firm to undertake an independent review of the revetment wall slumps.
16 May	PWC resolves to open an inquiry into certain aspects of the DUP including the revetment wall failure.
July	Major Projects Executive Committee and Finance and Investment Committee established.
18 July	Commonwealth approves the reallocation of Commonwealth contributions from projects with cost savings to fund an increase in project costs. The Commonwealth's funding contribution increases by \$37.6 million to \$533.6 million.
20 July	A section of the new lowered motorway and the Main South Road bridge to the lowered motorway opens to traffic.
6 September	Gateway South submits a \$29.2 million claim for works required to repair and rectify retaining and revetment walls.
10 September	PWC tables an interim report to the Parliament on its inquiry into the DUP.
28 September	Ayliffes Road flyover bridge opens to traffic.
18 November	The Commonwealth and SA Governments announce additional funding for the DUP of \$87.5 million to increase total funding for the project to \$754.5 million.

Appendix 2 – Response from Chief Executive of the DPTI under section 37(2) of the *Public Finance and Audit Act 1987*



Government of South Australia

Department of Planning,
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Mr Andrew Richardson
Auditor-General
Level 9
State Administration Centre
200 Victoria Square
ADELAIDE SA 5000

Dear Mr Richardson,

DARLINGTON UPGRADE PROJECT – REPORT 11 OF 2019

Thank you for providing a copy of your proposed Report 11 of 2019 *Darlington Upgrade Project*, and for your invitation to respond to it.

The Department of Planning, Transport and Infrastructure (DPTI) appreciates the thoroughness and objectivity of the analysis of the arrangements that have been in place since the project commenced a number of years ago. Your report provides clarity on when and where issues have arisen, and what should be done to address them.

As the body of the report notes, I have responded separately on each of the findings and recommendations detailed in the report, with actions that DPTI will take to address each of them. DPTI is fully committed to following through on these actions. We are now proceeding to secure external advisers with relevant expertise to assist us in reviewing, reshaping, and updating our Program Management tool kit, and implementing it across all Category One major transport projects.

Since your audit commenced earlier this year, the project team responsible for the Darlington Upgrade Project has been proactive in addressing the identified deficiencies in the documentation and management practices that support effective project delivery. As you will be aware, recent announcements have been made that address the funding issues identified in your report, and will now enable DPTI to progress the delivery to final completion on the current project timeline.

The guidance your report provides on the measures for DPTI to take to improve core processes and functions for major (Category One) project delivery will enhance our capability to perform our role effectively in delivering transport infrastructure for South Australia.

Finally, thank you for the words of appreciation for the support of our staff and management. Equally, I would like to thank you and your team for their diligence and professional conduct.

Yours sincerely,



Tony Braxton-Smith
Chief Executive

21 November 2019

Appendix 3 – Glossary

Abbreviation/Term	Description
Austrroads guide	Austrroads guide to road construction quality assurance
Category 1 projects	High value (over \$100 million), high risk projects
CGT	Collaborative Governance Team
CMF	Contingency Management Framework
CMP Standard	Contract Management Plan Standard for Category 1 projects
CVS	Construction verification and surveillance
DITCRD	Department of Infrastructure, Transport, Cities and Regional Development
DPTI	Department of Planning, Transport and Infrastructure
DUP	Darlington Upgrade Project
FIC	Finance and Investment Committee
FLP	Flinders Link Project
IFC	Issued for construction
MPEC	Major Projects Executive Committee
NCRs	Non-conformance reports
NPA	National Partnership Agreement on Land Transport Infrastructure Projects
PMO	Portfolio Management Office
PMP Standard	Project Management Plan Standard for Category 1 projects
PRP	Project Review Panel
PWC	Public Works Committee
QAntrol	Gateway South's quality management system
RMP Standard	Risk Management Plan Standard for Category 1 projects
Scheme 2B	Gateway South's design based on DPTI tender documentation
Scheme 2D	Gateway South's design based on revised traffic data provided by DPTI
SRO	Senior Responsible Officer
Teambinder	Information management system
TI 8	Treasurer's Instruction 8 <i>Financial Authorisations</i>

