New Zealand Transport Agency – Review of Connected Journeys Solutions
May 2019
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Executive Summary

The purpose of this report is to identify the key risks and opportunities associated with the products and services being delivered and supported by Connected Journey Solutions (CJS). The findings and recommendations should assist in decision-making regarding the way forward for CJS; including the location of operational functions within the business and the future of current initiatives.

Our findings describe a business unit that over the preceding 3 years was given an extraordinary degree of freedom and autonomy and relatively significant investment in pursuit of innovation. CJS is heavily focused on technology products, more specifically apps, and has a clear preference for developing in-house solutions. With the levels of autonomy and freedom provided to CJS, commitments were made by CJS on behalf of NZTA without explicit discussion or agreement by ELT or the Board as to compatibility with the wider NZTA goals and objectives.

Initially, CJS was set up as an NZTA innovation function, structured around an ideas pipeline to take concepts through innovation, incubation and finally integration with the core business. By default, CJS has become a secondary technology function for NZTA as well as being the innovation factory and leading a shift in digital ways of working. Such ownership of operational functions fundamentally sits at odds with the innovation value-chain concepts of progressively proving a concept in a safe environment before integrating it into operations.

Despite the significant operational responsibilities shouldered by CJS they retained their ‘innovation privilege’ – a mandate to drive change to build the future, challenge constraints and a license to operate without applying some of the applicable corporate policy and practices. This focus on innovation coupled with a lack of accountability undermined CJS’ ability to operate effectively and deliver quality products. Due to different ways of working and a lack of visibility in the wider organisation, CJS diverged culturally from the rest of NZTA and operated at arm’s length from management and governance functions within the rest of the NZTA. Due to the close relationship and direct channels between the Director of CJS and the former NZTA CE, the NZTA Board and Governance teams lacked visibility over many of the activities and issues that arose within CJS during this time.

‘Innovative change’ appears to have been pushed through without applying expected practices. This included examples of pushing through recruitment processes, disregarding advice and consultation with corporate procurement and instances where conflicts of interest have not been proactively declared or managed appropriately.
The expansion from a team of eight to more than eighty in two years brought challenges to the leadership of CJS. The team described a lack of clarity about their roles and responsibilities. Decision-making and approvals sat with a small privileged group within CJS and inconsistent communication of decisions resulted in people operating under assumptions rather than clear direction and strategy.

Within CJS, financial management was weak and there was a lack of visibility of the overall expenditure. Similarly, technology management maturity was lacking in comparison to other enterprise functions with a significant amount of technology. Shadow technology, inconsistent identity and access management processes and a lack of technical and architectural input have led to vulnerabilities in security and resilience.
Key Findings

Overall finding
CJS’ focus on innovation and a lack of oversight undermined its ability to deliver and operate quality products. Due to novel ways of working and a lack of internal visibility, CJS diverged culturally from the rest of NZTA and operated at arm’s length from management and governance functions within the rest of the organisation. CJS blurred boundaries between innovation and operational responsibilities.

Core Themes
Our review has a large number of findings, as we have identified a number of risks and issues associated with CJS. The findings are presented under six core themes.
Governance

Approval Processes (Page 265)

Key Finding 1: CJS uses a separate investment process for innovation, bypassing standard NZTA governance and controls; resulting in a lack of effective accountability.

- Innovation investments are given a stand-alone delegation – separate from all other investments. This is a prime example of innovation privilege.

- The delegations effectively provide direct authority to the CE to approve Executive Leadership Team (ELT) as the approving group. However, there is no formal quorum of ELT or definition of innovation and in practice, it appears approval requests such as bypassed ELT and were approved by the CE.

- CJS Project hiring and purchasing approvals were able to bypass standard processes and controls leading to non-compliance in some instances.

Monitoring and Accountability (Page 27)

Key Finding 2: Autonomy afforded to the Director of CJS prevented senior leadership peers from having visibility of required day-to-day working and some decision making occurring within CJS.

- CJS established a culture of independent authority, avoiding use of standard controls and processes in place for monitoring projects.

- There is a lack of visibility and transparency around assigned budgets. As a result, these budgets are not closely monitored or adhered to. In some instances, funds from one project have been transferred to another project, rather than investment approval being sought for additional funding.

Compliance

Recruitment (Page 29)

Key Finding 3: There are instances of direct appointments made to CJS leadership positions and exceptions to official HR processes.

- The Director of CJS pushed back when challenged on the high hourly rates paid to certain contractors in leadership positions, citing the risk to particular projects if the contract was not rolled over.

Key Finding 4: There is a lack of consideration given to ongoing support and maintenance requirements of CJS technology and solutions.

Links to numbered recommendations in next section:

# 2, 3, 4, 5

# 2, 4, 6, 9, 16

# 3, 4

# 1, 6, 7, 8, 10
• Contractors have been filling roles that may be more suited to long-term permanent employees.

• CJS has specific capability gaps that undermine their ability to implement and support CJS-developed technology solutions to an acceptable enterprise standard. This has had an impact on the upkeep and future usability.

**Procurement** (Page 30)

**Key Finding 5:** Until 2019, CJS actively avoided NZTA Procurement involvement

• The CJS Director took control of the direct sourcing of third party services and actively rejected Procurement involvement, citing urgency or lower-level pilot procurement to push through significant procurement decisions, such as with s9(2)(b).

• The failure to follow NZTA procurement policy and advice resulted in the organisation acting outside of the mandated Government Rules of Sourcing, particularly with respect to ensuring value for money through competition for government contracts.

**Intellectual Property** (Page 32)

**Key Finding 7:** Some of the CJS HR and technology practices (e.g. BYOD) increase the risk of Intellectual Property loss or theft.

• s9(2)(b)

• On a day-to-day basis it has not been made clear to CJS employees what NZTA’s IP policy is, what is expected of them and how this is managed.

• Use of personal devices and off-network systems limits monitoring and auditability of IP and privacy breaches.

**Leadership**

**Roles and Responsibilities** (Page 33)

**Key Finding 8:** Many CJS team members are unclear or uncertain about their roles and the roles of others, and who holds the authority and accountability within CJS.

• Role changes have been made informally and role descriptions are not updated, resulting in confusion over responsibility (or no responsibility) for certain tasks.
Clarity of Objectives (Page 36)

Key Finding 9: There is a lack of accountability to deliver on time and high quality, coupled with poor project management and governance practices.

- Many of the CJS team enjoy the culture of freedom and autonomy, but acknowledge that controls were bypassed for expedience.

Financials

CJS Financial Management (Page 37)

Key Finding 10: Lax financial governance within CJS combined with limited accountability led to poor financial management practices and limited monitoring of CJS.

- The rapid growth and reorganisation of CJS created an environment that needed clear processes and guidelines for the team. There was limited financial guidance and enforcement to implement corporate processes and controls.

- There is a perception within CJS that funds do not need to be clearly accounted for and can be reallocated if there are cost overruns. This lack of clarity reinforces undesirable behaviours of non-adherence to policies and accountability.

- There has been a practice within CJS of incurring costs prior to budget approvals.

CJS Reporting (Page 38)

Key Finding 11: There has been fragmented financial oversight, reducing visibility of the overall financial position and management of CJS.

- Reporting is produced for senior leadership but there are omissions.

- The CJS Director did not consistently provide explanations to the Management Accountant of cost overruns in reported budgets and there were no consequences in CJS for cost overruns.

- There is a lack of common definition around transport technology expenditure, which has led to an inability to identify what should be included in CJS reporting to accurately identify expenditure.

- A significant portion of CJS funding was for maintenance and operation of core technology and large programmes which blurred the visibility of CJS as an innovation function. Overruns seemed less significant in proportion to the overall spend.
Technology

Management Controls (Page 44)

Key Finding 12: Existing CJS solutions and products have significant risks regarding quality of implementation and reliance on third parties.

Key Finding 13: Technical and architectural maturity is low, with critical technical decisions being made without sufficient regard for the required technical expertise.

- Technical and architectural decisions have been made that appear to have exacerbated avoidable technical debt.¹

Ways of Working

Agile/DevOps (Page 46)

Key Finding 14: CJS have started NZTA’s journey to digital transformation and have initiated Agile and digital ways of working that are widely accepted as integral parts of a modern IT operating model. However, significant improvements in maturity and adherence to controls will be required to ensure outcomes are achieved effectively

- Practices across CJS are varied and cross-team alignment is limited, which undermines quality.

- Wider communication outside CJS is limited, which in some cases limited the free exchange of critical information to senior leadership, third parties and project teams.

- CJS committed to a significant in-house development capability focused around the development of web and mobile apps without clear oversight of the Executive or Board. These developments were not checked to see if their capability aligned with the wider organisations’ approach to sourcing technology.

Strategic Relationship Management (Page 47)

Key Finding 6: Important strategic third-party relationships are being eroded.

- S9(2)(b)

¹ Technical debt in this context means the implied cost of additional rework caused by choosing an easy solution now instead of using a better approach that would take longer.
s9(2)(b)
Recommendations

The following recommendations aim to prevent or minimise identified issues from being repeated in future. These are directed at the operation of CJS but NZTA may wish to consider the potential for organisation-wide applicability.

For ease, the recommendations are written from the perspective that CJS will continue as a distinct business unit with similar functions. These key recommendations are not duplicated throughout the report, as they are often overarching and span a number of different areas. These recommendations have been highlighted in this section due to their importance or wider reach. Other recommendations are located in blue boxes throughout the report.

1. **Build common understanding across NZTA Leadership on the central purpose and structure of CJS going forward.**
   - Use this consensus around purpose to make unified and aligned decisions on the right focus and structure of CJS.
   - Separate the Innovation function from operational functions to provide clearer domain and mandate. This could include shifting the focus toward building network and partnerships that deliver on the Government Policy Statement for land transport (GPS) rather than developing technology solutions in-house.
   - Review the key capabilities and the roles required to achieve CJS’ central purpose.

2. **Enhance visibility of CJS throughout NZTA by ensuring that the purpose and objectives of CJS are clearly defined and communicated with all NZTA staff.**
   - Enhance the reporting visibility of CJS through regular engagement with other areas of the business including (but not limited to) the ELT, Technology and Finance.
   - Ensure that the purpose and objectives of CJS are closely linked back to NZTA’s purpose and objectives.

3. **Ensure CJS governance principles and requirements are clearly specified and understood throughout CJS so that managers understand how and when to use governance mechanisms effectively.**

4. **Ensure current CJS roles and responsibilities are clearly specified and described within the employment contract.**
   - Role descriptions should be updated when appropriate and clearly outline expectations. Clarity should be provided related to direct lines of reporting and team structure.
   - Responsibilities around standard NZTA financial management, including spending should be communicated to CJS staff.
5. Ensure CJS contractual and financial delegations are appropriate, clear and simple enough for a reasonable person to intuitively understand and apply.

- Reinforce innovation funding controls by agreeing a governance mandate for the use of innovation funds and tightening governance to include a quorum requirement, to reduce the risk of individual influence.

6. Build consensus around how NZTA aim to achieve the innovative use of technology objectives set out within the Government Policy Statement for Land Transport.

Then consider:

- What capabilities are required to deliver accordingly over the short, medium and long term;
- The balance of core vs. transformational efforts and corresponding risk appetite; and
- Where capability would best be situated within CJS and the wider organisation.

7. Review in-flight programmes’ scope and health to rebalance core technology maintenance and enhancement against customer experience apps.

- The ITS network needs to be significantly upgraded. The replacement of this network technology will alleviate current security risks and likely reduce the cost of upkeep.
- Ensure scope remains achievable with funding and resources available and that capability investment aligns with objectives.

8. Elevate the importance of technical architecture and design planning in guiding and approving decisions relating to transport technology.

- This is particularly important in relation to improving network security, integration and resilience.

9. Develop and enforce Change and Release Management standards, with consistent quality checks performed and tested on all Transport and Innovation technology products/projects.

- Product Leads should be accountable for quality, and an independent go/no-go criteria for acceptance should be met before any release.
10. Continue to build NZTA’s role as custodian and steward of data that is intrinsic to the New Zealand land transport network, such as real-time journey time prediction.
   
   - s6(a), s9(2)(b), s9(2)(c)

11. Align the approach for capturing and reporting transport technology expenditure throughout the organisation.

   - Define the owner of transport technology and communicate this to the wider organisation.
   - Work with Finance to capture and define the costs.
   - Ensure all major capital expenditure can be identified and tracked, implement a consistent coding structure, map asset expenditure, and keep reliable data on financials.

12. Improve protection of Intellectual Property created by CJS for NZTA.

   - Review and strengthen Intellectual Property clauses in both CJS contractor and permanent employee contracts.
   - Review device management and policy associated with ‘Bring Your Own Device (BYOD)’. For example, ensuring devices are suitably cleansed by NZTA prior to employee exit.

   - s6(a), s9(2)(b), s9(2)(c)

13. Develop lessons learned from CJS with reference to industry best practice as a way to establish a new digital foundation

   - Codify agile and DevOps processes so that regardless of delivery method there is appropriate planning, tools and guidance, reporting, and governance.
   - Help shift the culture from ‘start-up’ to ‘scale-up’ – focus on building process, networks and systems rather than ‘move fast and break things’.
   - Standardise and de-duplicate internal tools – use the opportunity to select leading practice tools and integrate and automate where possible as part of building digital maturity.

14. Invite key stakeholders to a re-launch session(s) when changes regarding technology and innovation have been agreed in order to promote new ways forward and mend or maintain current relationships.

   - Make a plan and take steps to reopen communication channels regarding technology or innovation with key
stakeholders from across the sector, providing an explanation of previous activities and expectations of the future.

- Define and broaden the roles and responsibilities required for stakeholder management.
- Ensure key external relationships are not held by any one individual in order to prevent loss of relationships should employee leave.

15. In periods of high change and growth in the transport and innovation technology team, ensure adequate change management is in place and employees understand changing expectations and roles.

16. Promote a culture within CJS of taking personal responsibility to deliver on the objectives of NZTA in a way that is accountable to the NZ public.

- Increase awareness of whistleblowing policies and proper reporting channels to raise concerns.
- Empower employees to feel as though they can safely challenge, call out, or escalate issues, including improper decision-making or behaviours.

17. NZTA must make a decision as to the continued use (or otherwise) of the CJS Cloud Platform.

- Consider the option of a comprehensive re-platform rather than remediation in order to sufficiently mitigate the risk of unknown vulnerabilities and dependencies in the current configuration.
- Ensure that all technological decisions relating to the products and services that CJS is accountable for are made by those with the appropriate knowledge and expertise to understand risks and issues that occur with each option.
Introduction

Background
Deloitte was engaged in March 2019 to undertake a review of Connected Journeys Solutions (CJS).

NZTA has a vision to develop one connected transport system, by integrating digital technology and physical infrastructure to create a safe and connected system for the unique New Zealand landscape. Connected Journey Solutions has a focus on using technology and data to provide New Zealanders and our many visitors each year with safer, sustainable, and more connected journeys.

Purpose of the Report
The purpose of this report is to identify the key risks and opportunities associated with the products and services being delivered and supported by CJS; the software being used, and the relationships with, and commitments made to, third parties.

Inevitably, some findings and recommendations may have implications or be applicable to other parts of NZTA, however the report is limited to findings related to CJS specifically.

The findings and recommendations will assist NZTA in decision-making regarding the way forward for CJS; including the location of operational and innovation functions within the business, and the future of current projects.

Scope of Review
The scope of this review is limited to the current operating state of Connected Journey Solutions. Where necessary, the review has sought to understand historical behaviours and activities where they may have led to current risks and issues. Recommendations on the structure of CJS or possible disestablishment was not in scope, so the recommendations assume CJS continues.

This review was done in conjunction with the All of Government Consultancy Services Order dated 21 March 2019 and addresses specific instructions related to the review of CJS.

This review covers activities from the period from 2016 up until the departure of the CJS Director in 2019. Activities and decision-making prior to the creation of CJS lie outside the scope of this report.

Approach to the Review
The initial timeframe for this review was four weeks, with weekly reporting to the steering group in order to surface findings quickly. At the outset, the approach was to be fluid and responsive, given that the nature of the findings were unknown at that time.
A combination of interviews and substantiating interview findings with documentation has been the predominant approach. At the conclusion of the review, we have conducted over 30 interviews with individuals within and associated with CJS. Over 200 documents have been received and reviewed.

CJS staff were invited to directly approach Deloitte to share anything they wished NZTA to be aware of and twelve people came forward to be interviewed.

The former Chief Executive, and former Director of Connected Journeys Solutions were not interviewed or consulted as part of this review.

We have formed observations based on feedback themes identified through these interviews, validating these where possible with review of supporting documents, or corroboration with other staff.

Further detail on the documents received are included in Appendix 1.

**Structure of the Report**

This report is structured by setting out the key findings and recommendations up front to provide clear direction to the report.

The report is then split into a detailed introduction and context of the report, and is then split into a deep dive into the six CJS themes first introduced in the key findings.

**Limitations**

The terms of this engagement and the scope of the work NZTA have asked us to undertake do not comprise an audit or a review engagement, and the assurances associated with those reviews are not given. The work did not constitute an assurance engagement in accordance with the requirements of the Chartered Accountants Australia and New Zealand, and was not designed to provide assurance accordingly under International or New Zealand Standards on Auditing or Assurance such as ISAE 3000. Accordingly, no assurance opinion or conclusion has been provided.

Assessments are based on observations from our review undertaken in the time allocated. Assessments made by our team are matched against expectations and good practice guidelines. Conclusions were formed based on the information provided, including documents and discussion with various NZTA staff members. This report offers recommendations for improvements and has taken into account the views of management, with whom these matters have been discussed.
The matters raised in this report are only those which came to our attention during the course of performing our review and are not necessarily a comprehensive statement of all the weaknesses that exist or improvements that might be made. In practice, it is not practical for us to examine every activity and procedure, nor can external review be a substitute for management’s responsibility to maintain adequate controls over all levels of operations and their responsibility to prevent and detect irregularities, including fraud. Accordingly, our report should not be relied on to identify all weaknesses that may exist in the systems and procedures under examination, or potential instances of non-compliance that may exist.

This report has been prepared for distribution to the NZTA. We disclaim any assumption of responsibility for any reliance on this report to any other persons or users, or for any purpose other than that for which it was prepared. We note that we are not qualified to provide legal advice and nothing in this report should be deemed legal advice.

Acknowledgements

We thank the NZTA Management Team and other individuals involved in our review for their assistance during the engagement.

We would be pleased to discuss any items mentioned in this report and to review the corrective action implemented by management.
Context

Connected Journey Solutions

Connected Journey Solutions started life as a relatively lean innovation unit of eight FTEs, structured around a purpose for quickly progressing ideas through innovation, incubation and integration.

However, as ideas like the mobility as a service marketplace progressed from concept to pilot and went on to become a large, complex delivery programme, CJS grew too. In two years, the team expanded more than tenfold, and became responsible for building and implementing an ambitious technology suite of products and services. During this early period of growth, the NZTA component of the National Ticketing programme was also given to CJS, putting them at the centre of key partnerships with local transport authorities nationwide. NZTA’s role in National Ticketing is primarily as an enabler in terms of coordination and funding.

CJS expanded further when it became responsible for the Intelligent Transport System (ITS), a portfolio of the core transport technology underpinning NZ’s road network. As with the addition of the National Ticketing programme, CJS was again responsible for more than developing and integrating ideas. It had accountability for core operational technology that sat within its domain and responsibility to maintain this. Such ownership of operational functions fundamentally sits at odds with the innovation value-chain concepts of progressively proving a concept in a safe environment before integrating it into operations.

By default, CJS has become a secondary technology function for NZTA as well as being the innovation factory and leading a shift in digital ways of working. While this may be a simplification of the many twists and turns in the short history of CJS, it serves to illustrate that its overarching purpose and function has been blurred.

CJS is heavily focused on technology products, more specifically apps, and has a clear preference for developing in-house solutions. With the levels of autonomy and freedom provided to CJS, commitments were made by CJS on behalf of NZTA without explicit discussion or agreement by ELT or the Board as to compatibility with the wider NZTA goals and objectives. CJS committed to the development and ongoing maintenance of software and applications, without such agreement, despite a negative wider-government track record of such activities.

CJS’ core functions include the fostering of innovation wherein they develop innovative products and services through market research, design, development and implementation. This is all done within the context of road and transport technology. For the purposes of this report, these functions are defined as:

- Innovation (including mobility lab and innovation zone)
- Core Transport Technology (core road network technology support)
- System integration and cloud
In addition, significant programmes also sit within CJS:

- MobilityOS
- TransportOS
- Future Transport
- National Ticketing

For the purposes of this review, Core Transport Technology refers to the day-to-day land transport network technology support operating functions, and is distinct from TransportOS. It does not encompass the initiatives within MobilityOS or TransportOS programmes. However, TransportOS has responsibility for areas that overlap such as the Dynac ATMS replacement which sits within TransportOS.

Internally CJS team members are structured around Product, Engineering and Operations verticals – with Engineering encompassing both Development and System Engineering. These teams have practice leaders within CJS although the individuals tend to report within the programmes they support.

The way the programmes operate is focused around products rather than the more traditional project basis. Funding is awarded to programmes such as MobilityOS on the basis of defined objectives delivered to a set timeframe. The product lifecycle is more open ended in terms of time, being that a product continues to be maintained while it provides value to both the customer and its owner. A project or programme is a useful structure with which to establish products however and the two can be complementary.

A product manager sets the vision for a product that needs to be built, gathers requirements, and prioritises them, while a project manager acts upon this vision and makes sure that it is executed on time and on budget.

After the product is established, it needs appropriate maintenance, support and enhancement, which is typically delivered by an operations team.
Programmes

MobilityOS

MobilityOS has secured $[2](b) in funding to establish the Mobility as a Service marketplace platform and associated apps. However, the level of justification provided in the business case appears to be much less than would typically be required for a substantial technology project that has elected to take a higher risk than normal approach to delivering the solution. While the proposition may be valid, it does not appear to have been rigorously tested prior to funding being approved despite conducting pilots in Queenstown and Auckland. Instead, a survey was conducted asking people whether they would be likely to change modes.

MobilityOS currently encompasses two technologies, a predictive modelling engine, and a booking/payment interface app. Without this predictive modelling element, NZTA relies on Google to provide journey time data based on Mobility data from android devices.

Since the start of NZTA’s foray into MaaS, the Google Maps application has continued to evolve. It now provides journey-planning solutions including bus, bike, car-share (Uber, Lyft, Zoomy etc.) alongside walking and private vehicles. Accordingly, the likelihood of widespread uptake of an NZTA developed Mobility as a Service mobile application must be decreasing. The complex competitive ecosystem is already moving to meet consumer’s needs.

Notably, those needs will not always align with local and central government priorities to shift modes toward increased use of active and public modes. This is where mobilityOS can be of considerable value, both to the NZ urban public and to NZTA. Providing essential data to improve the fundamental proposition of alternative modes.

NZTA can actively improve the availability and accessibility of location data for multiple modes. For example, helping bus providers to standardise vehicle location data and combine it with predicted journey times to help the public make more confident choices regarding public transport. Even if the interface is through Google Maps. No other single organisation is as well
placed with operational relationships to help achieve the digitisation of the commercial transport industry.

**TransportOS**

Part of NZTA’s role as the operator of New Zealand’s land transport network is to provide information to users of the network. Communicating incidents, roadworks and closures are particularly critical but route and journey information is also becoming increasingly vital and the benefits of good real-time data about network usage is already well proven.

The substantial TransportOS funding sought has not yet been approved. TransportOS is in programme establishment mode, yet the programme has seven contract software engineers, nine contract product roles and no official solution architect. This does not include transport technology or integration resources. The TransportOS product roadmap is still in development and has been pending for over 7 months. Without this, it is unclear what the ‘fabric’ or nexus of the transport operating system consists of.

The dominance and confusion surrounding the ‘product centric’ way of working within CJS, and particularly TransportOS has led to project managers, procurement and architects being wrapped up under the banner of product manager. In some instances, this has led to a lack of focus on the individual roles required.

**Core Transport Technology**

The existing technology landscape needs maintenance, support and enhancement and the current investment requirement for Transport Technology is significant.

Core transport technology mainly encompasses existing technologies that support and maintain the transport network. In future, they may all be incorporated into the Transport Operating system construct. However, the product roadmap for TransportOS is not currently available.

**System Integration**

Currently the technical leadership around integrating systems and third parties is not consistent, leading to a proliferation of point solutions. Continuing without an enterprise-wide integration strategy will accumulate technical debt, requiring significant investment downstream in order to resolve.
Leadership

CJS was formally established on 1 July 2017, with the newly created position of Director of CJS reporting directly to the then CE. At the time, the group was structured around the concept of a value chain of innovation. Three leads, who reported directly to the Director, were each in charge of Innovation, Incubation, and Integration. At the time, CJS totalled no more than eight full time equivalents.

Prior to CJS being formally established, the CJS Director was in a fixed term secondment role as Director of CJS between 3 October 2016 and 1 July 2017. During this period, the Mobility as a Service marketplace pilot project (MaaS) was being developed in Queenstown. MaaS continued as a core project for CJS through until August 2018, after which it became part of the MobilityOS programme.

The Director resigned his position effective from 19 March 2019. Stemming from this resignation, Deloitte was engaged to review the CJS function.
Timeline

The timeline below provides a brief view of key CJS events over the last four years.
Governance

Key Findings:

- Key Finding 1: CJS uses a separate investment process for innovation, bypassing standard NZTA governance and controls; resulting in a lack of effective accountability.
- Key Finding 2: Autonomy afforded to the Director of CJS prevented senior leadership peers from having visibility of required day-to-day working and some decision making occurring within CJS.

Governance is concerned with ensuring the overall direction, effectiveness, supervision and accountability of an organisation. Good governance ensures the upholding of law and regulation and that an organisation is well run and efficient.

Approval Processes

As a business unit within NZTA, CJS should be expected to adhere to the same policies and processes as the rest of the organisation. However, standard processes were sometimes avoided or sidestepped, either purposefully or inadvertently through CJS’s insular culture.

Interviewees described various instances where standard corporate processes were ‘bypassed’ to achieve desired results quickly and without challenge. Documents reviewed supported this with instances of recruitment of employees outside of recommended recruitment processes and the procurement of vendors without the consistent application of NZTA procurement rules.

CJS Programme Managers met regularly with the Director of CJS to make strategic business and funding decisions. The Director of CJS was expected to then put these decisions to the Technology Governance Group (TGG) for endorsement. In line with the innovation business case delegations, the executive leadership team (ELT) effectively form the primary investment authority for CJS initiatives.

The Director of CJS was understood to be the primary conduit between the business unit and the governance groups and in effect, this limited visibility from both sides. CJS managers had the understanding that the Director was across the strategic direction of CJS and would therefore raise significant project, investment and programme decisions. The Director had control over how and when to share information, and at times proceeded to use this to influence outcomes. For example, the decision to proceed with the selected cloud solution. While it was shared with TGG, where it was challenged and questioned it did not appear that TGG was given an opportunity to approve, endorse or reject the decision prior to it being acted on.

Recommendations:

Enhance awareness with CJS managers of expectations relating to governance principles and requirements (G1)
This resulted in a lack of intervention taken by the Governance groups (who were held at arm’s length) and CJS managers around the failure to adhere to expected approval processes.

The relationship between the CJS Director and the former NZTA CE was one of high trust. Both shared the vision of an innovative digital future for New Zealand and its transport systems. The Director of CJS had a great deal of autonomy to operate and make approval decisions that were not in keeping with NZTA’s expected processes.

**Decision Making**

The ability to apply different processes and thereby circumvent NZTA corporate controls, meant that the Director of CJS had autonomy to make decisions without other areas of NZTA having visibility of CJS operations. This approach, with support from the CE, further perpetuated an impression that CJS was a separate domain, and special enterprise. Decisions were often justified based on the premise that work was urgent and could not wait to proceed through formal NZTA approval channels. An example of this is the dedicated investment process for innovation initiatives, which is a separate process that sits within the standard NZTA corporate investment decision making delegation and appears to be uniquely for CJS. The current delegations were brought into effect in July 2017, around the time CJS was formally established. However, it is unclear whether this exception process was established specifically for CJS or whether it predated CJS.

CJS managers made decisions based on a one-up approval, meaning that investment and project decisions were escalated to immediate managers within CJS. Managers of CJS indicated that plans and significant programme decisions were communicated to the Director of CJS through business cases. Under the delegations framework these business cases were to be presented to the NZTA Executive Leadership Team (ELT). However, we understand no such discussion took place at ELT. While the ELT was considered a formal forum during the period between July 2017 and December 2018, no terms of reference, meeting minutes, or decisions appear to have been recorded. As such, there was no formal communication back to the managers about decisions.

Because of this autonomy, key decisions such as ones relating to future transport and ITS technology appear to have been made without the appropriate procurement or technical and architectural advice. Technical and architectural decisions have been made that appear to have resulted in avoidable technical debt such as the selection and poor implementation of the cloud solution of choice.

**Recommendations:**

1. Ensure all business groups are subject to standard corporate policy and processes. (G2)
2. Review key technical and architectural decisions of CJS projects. (G3)
Monitoring and Accountability

The majority of CJS leadership do not have significant prior experience leading large-scale public programmes. This means that many of those with decision-making authority did not necessarily have the understanding or experience to make considered decisions in a public sector context. For example, abiding by government rules of sourcing. Due to the level of trust provided to the CJS Director by the former NZTA CE, the Director and the activities undertaken within CJS were not held to the same level of accountability as other projects across NZTA.

Although leadership decisions were discussed amongst the wider CJS team, the level of challenge and questioning of decisions and process within the team appeared to be limited or ineffective. Under the assumption that the CE was aware or supportive of many of the Director’s actions, (such as investing in the G-Suite and associated Jam boards) many team members did not feel empowered to raise issues any further. Such investments compounded the innovation privilege that existed, and increased the associated communication and file-storage challenges.

With expectations of the CJS unit to be new, ‘different’, and ‘innovative’, the decisions made between the Director and the CE were not closely monitored by NZTA leadership. This contributed to a failure to hold either party to account.

Recommendations:

Ensure all projects have processes and tools to produce adequate required reporting. (G4)

Ensure that CJS leadership understand what they are accountable for. (G5)

Ensure that managers are being held accountable for not following processes. (G6)

Ensure that all staff are empowered to safely challenge questionable decision-making. (G7)
Compliance

Key Findings:

- Key Finding 3: There are instances of direct appointments made to CJS leadership positions outside of official HR processes.
- Key Finding 4: There is a lack of consideration given to ongoing support and maintenance requirements of CJS technology and solutions.
- Key Finding 5: Until 2019, CJS actively avoided NZTA Procurement involvement
- Key Finding 6: Important strategic third party relationships are being eroded.
- Key Finding 7: Some of the CJS HR and technology practices (e.g. BYOD) increase the risk of Intellectual Property loss or theft.

Non-Adherence

A common theme across our findings has been a lack of adherence by CJS staff at various levels to formal and non-formal processes and procedures. There are three common reasons why CJS failed to comply:

- Perceived urgency;
- Innovation privilege; and
- Complexity (people fail to comply because the complexity of the requirement is such that compliance is overly burdensome).

Urgency

NZTA use stage gates and appropriate risk mitigation procedures to prevent erroneous and damaging decision-making. These check and balance processes, such as the meeting of the Technology Governance Group and decisions such as those relating to technology security assessments taken to the Corporate Services General Manager for approval, were on occasion ignored by CJS, with the team seeing such a delay as an unnecessary limitation to an otherwise quick and agile process. The perception relayed to us was that the CJS Director believed that following processes was a time consuming burden, which did not support the urgency of innovative decisions being made.
Innovation Privilege

Innovation privilege is a term used to describe the special considerations, unique environment and free steer given to teams to work in new and experimental ways. This privilege can be divisive and often reduces the key communication channels and balances that originally existed between the innovative team and the rest of the business.

The nature of the business unit and close relationship between the former CE and CJS Director led to innovation privilege similar to that discussed above. Expected to act in an agile and innovative way, decisions were made without considering standard controls; the Director had financial discretion to make high-cost decisions without requiring oversight of the technology governance group or the NZTA Board.

Overall, due to this innovation privilege, non-adherence to policies and other formal expectations were not only accepted by senior CJS leadership but also anticipated.

Complexity

CJS project scopes were often fluid and lacked boundaries. Without an intuitive structure, appropriate guidance or information required to perform tasks expected of them was unclear. This complexity of processes and structures led to a key cause of lack of compliance and non-adherence.

The delegations process is a clear example of an overly complex process that in many cases led to such behaviours. Laid out over numerous pages, and with multiple exceptions and requirements, employees were unable to apply the delegation procedures and the clarifications and caveats that surrounded individual delegations.

Recruitment

The need for quick expansion of CJS meant that applying NZTA recruitment processes was not always a preferred way of conducting operations. Contractors were hired through recruiting agencies and directly sourced from existing professional relationships. The Director of CJS had a technology background and appears to have had or established contacts in California, that he drew on when senior expertise was required.

There were instances of direct appointment of positions outside of HR processes and retrospective completion of compliance documents. In these instances there was discussion of the appointment with the former CE, however consultation with HR did not occur. In other instances, HR was not provided with copies of contractor agreements. These contractors are no longer employed at NZTA.

The high use of contractors within CJS means that a large amount of IP sits with individuals who are only meant to have short-term roles in the organisation.

Recommendations:

Review investment processes to incorporate overarching standards and stage-gates to prevent exceptional investment pipelines. (C2)

Ensure that processes have clear boundaries and are straightforward. (C3)

Align the delegations with industry best practice. (C4)

Consistently review team makeup and needs to determine if contractors should be offered full-time positions/contractors should be replaced. (C5)
Despite the number of contractors who have been hired, CJS still do not have enough combined capacity to maintain the products and systems that it has responsibility for. Choosing to focus roles and expertise on development and transformation rather than current operational tools and software, many heritage tools under CJS’s remit have been left to degrade as a result.

While this model is appropriate for projects, it is not recommended for strategic or management roles. When the previous CJS Director was challenged about tenure and hourly rates of contractors (as opposed to permanent staff), he pushed back, citing the risk to in-flight projects if specific contracts were not rolled over.

**Procurement**

Historically CJS avoided consulting with procurement and appeared to be enabled by a supportive CE if procurement processes were too cumbersome or if opinions differed.

Various vendors were directly sourced with little regard for establishing competitive processes or consideration to AoG processes citing urgency or pilot procurement requirements. The result is not all existing contracts are managed on a central basis and there is limited visibility of the contracts with these vendors.

**Recommendations:**

- Ensure that those in charge of hiring staff are aware of best-practice and NZTA policies. In addition, introduce tracking of the length of time contractors have been with the organisation to enable informed assessment of roles and how they are filled. (C6)

- Review conflict of interest check procedures for all staff involved in procurement decisions. (C7)

- Provide strict enforcement of procurement protocol regarding competition and opportunity. (C8)

- Review services provided for the monthly maintenance charge and consider other regular technology maintenance payments. (C9)

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s6(a), s9(2)(b), s9(2)(c)
Not all CJS procurement activities occurred without the Procurement team’s involvement. NZTA procurement are actively involved with CJS in a number of significant procurement activities such as the ATMS procurement, ITS panel establishment and the NZ mobility lab. This shows that failure to adhere to NZTA processes was not consistent. More recently, the procurement team has been successful at engaging CJS in discussions about developing a specialised procurement plan, based on their pipeline of work. Overall, it is very positive to see the level of engagement has materially improved and CJS are seeking and adhering to advice from Procurement.

**Conflict of Interest**

The CJS Director held close prior professional relationships with at least two of the staff he hired into leadership roles within CJS. The Director was vocal about the personal nature of these relationships and it was not kept a secret that he was looking to hire these people based on their previous technical experience as well as their ongoing professional relationships.

The hiring of two contractors occurred outside of normal standard recruitment processes. This is unusual, and due to expectations around equal opportunity hiring, this process should have considered the exploration of other potential candidates with a similar skillset and potential. The Director’s actions may not have resulted in a conflict of interest, however he did not follow NZTA processes and formally declare the relationships, or manage the risk associated with them.

There have been concerns related to potential conflicts of interest in relation to \(\text{s9(2)(b)}\). However, no formal conclusions pointing to an actual conflict of interest have been found by NZTA when further reviewed.

Our review detected at least one additional potential conflict risk; \(\text{s9(2)(d)}\). Procurement were not privy to this business relationship and it is unclear what services were provided to NZTA.

**Recommendations:**

Reinforce the application of conflict of interest policy and expectations to staff and contractors. (C10)
Intellectual Property

Our review found that CJS has not adequately considered or addressed its additional responsibility of protecting intellectual property that has been developed. CJS interacts with a large number of public and commercial stakeholders and as with any large group, staff and contractors join and leave the business. There are gaps in both HR and technology practices that make it difficult to monitor the use and distribution of intellectual property. This exposes NZTA to risk of intellectual property loss or theft.

In the limited number of contracts reviewed, we have noted that Intellectual Property clauses were not consistently included. When such a clause has been included, contracts for both contractors and permanent employees do not clearly explain the responsibilities and expectations in relation to CJS innovation and product development. As a result it has not been made clear to CJS employees and contractors what NZTA’s IP policy is, what is expected of them, and how this is managed.

As a result of CJS’ significant use of shadow technology systems (those purchased and configured without corporate IT involvement), there is a general lack of monitoring and auditability. This is a result of the majority of systems being off-network coupled with permissive device management policy (or lack thereof) that has allowed CJS staff to use personal computers for NZTA work without installing corporate management profiles on the devices.

A number of the code and document repositories lack enterprise auditability functions and identity and access management maturity is low. With users (incl. third parties) being assigned greater than necessary privileges in a number of cases. The combined effect is that there are gaps which could be exploited by individuals wishing to use NZTA intellectual property for their own purposes and benefit.

Recommendations:

Intellectual Property clauses should be reviewed and amended in both contractor and permanent employee contracts. (C11)

Review systems for enterprise auditability functions and identity and access management processes. (C12)
Leadership

Key Findings:

- Key Finding 8: Many CJS team members are unclear or uncertain about their roles and the roles of others, and who holds the authority and accountability within CJS.

- Key Finding 9: There is a lack of accountability to deliver on time and on quality coupled with poor project management and governance practices.

The CJS Leadership was made of six roles reporting to the CJS Director, who in turn directly reported to the former CE until January 2019. The leadership team were in charge of the direction of the business unit, the roles and responsibilities employees took on, general business accountability, the shaping of the culture and team dynamics, and of business objectives. Ultimately, the leadership team were responsible for the success of their employees and the products developed within CJS. The structure of the business unit was purposefully designed by the CJS Director to be un-tiered, however this inadvertently contributed to blurred reporting lines.

Roles and Responsibilities

CJS started as a purposefully small innovation team set up as a low-risk way for NZTA to explore and develop innovative and modern ways to think about transport technology. This purposefully flat structure quickly grew and began to shape large innovation projects, leading to the CJS team growing from 20 to 100 people within a single year. This increase in staffing numbers was not visible (or at the most, very limited) at the ELT level, despite a requirement for all additional staffing posts to be discussed and agreed amongst the group. At this time the business unit was home to both innovation and heritage projects such as MaaS, Traffic Watcher, ITS, and Weigh Right.

The transformation of CJS led to the introduction of corporate technology staff, along with new and existing CJS employees with the reallocation of a number of roles. With such a rapid increase in team size and with new projects underway, the flat structure was no longer suitable as a means to organise lines of reporting. However, no restructure to the original format occurred. This left many CJS employees with little clarity as to their roles and responsibilities. The amalgamation of contrasting ways of working (i.e. operations vs innovative) diluted CJS’s original purpose, and was not directly addressed by the CJS Director.

With a history of reallocation of in-flight projects to the CJS team, budget allocations did not follow these changes in responsibility. An example of this
has been with the Tolling project, which was designated the responsibility of CJS, without having the budget pass to the CJS team who are now responsible.

The majority of CJS staff are contractors, with some teams (of around 25 people) entirely made up of temporary staff, many of whom do not have a background in transport. The majority of these contractors have had their two-year periods extended to further multi-year contracts, including those in key leadership positions. Despite the number of contractors who have been hired, CJS still do not have enough combined capacity to maintain the products and systems that the unit has responsibility for. By choosing to focus roles and expertise on development and transformation rather than current operational tools and software, many heritage tools under CJS’s remit have been left to degrade.

Roles and responsibilities have been unclear since the growth of CJS with uncertainty around who owns decisions and systems.

Senior CJS leadership has not been provided with the necessary clarity and definition around accountability and organisational channels. Adding to this, very little definition has been given to the scope and aims of many projects, in turn leading to lack of definition of CJS’ purpose and objectives, along with roles and areas of responsibility for the staff who are working on them. The deficiency in traceability, accountability and clear responsibility delegation can be correlated with the CJS’ Director’s attempts to work in a fully DevOps manner.

Due to this lack of clarity around employee roles and the responsibilities of individuals and of teams, there is a higher than normal rate of attrition, irrespective of projects. This has led to greater levels of stress and confusion among remaining staff who find themselves with increasing workloads and a lack of transparency around people coming and going.

**Skills and Capability**

Currently CJS has around 100 people, 83 of which are in contract or fixed term roles. These positions are not funded long-term, yet MobilityOS and TransportOS are clearly long-term propositions to maintain.

Consideration should be given to what the right ratio of contract versus permanent roles are in the team. A lack of permanent roles increases the risk of jobs being completed with a short-term lens with little regard to the future support, maintenance, and enhancement requirements. Contractors should be employed to support a core team to fill product establishment roles and areas as-and-when they are required.

The technology skills found within CJS reflect the direction that the unit has taken over the past two years. This technological capability includes a significant software development function of at least 25 people, with many sub-disciplines. At present – noting that no detailed workforce analysis has been undertaken – it appears that the skills within CJS are mostly suited to the development of web and mobile applications, with a lack of experience with enterprise systems and standards.

**Recommendations:**

Consistently review the makeup and needs of teams to determine if contractors should be offered full-time positions or be replaced due to new project requirements. (L3)

Ensure every role and project has a well communicated scope (or appropriate alternative) along with timelines of strategic events and decisions. (L4)

Develop reintegration and change management strategies and an implementation plan for bringing CJS back into the wider NZTA business (if this approach is taken for CJS). (L5)

Ensure key external relationships are not held by individuals to prevent loss of relationship should employees leave. (L6)

Review the number of contractor roles within CJS. Look to refine contractor roles on a specific project-by-project basis. (L7)
Team Culture

The culture of any organisation often stems from the views and actions put in place by a team’s leadership to foster certain values and ways of working. Feedback we received on the culture of CJS was divided, some considering the environment toxic and others thriving in an innovative forward-thinking environment.

CJS attempted to operate in a similar fashion to a start-up company, with an open, innovative and a ‘fail-fast’ mentality. This however is a difficult task within the constraints of an established enterprise organisation and CJS’ responsibility for both innovation and core technology. The CJS Director attempted to maintain this mentality despite its challenges, which led to a combative and divided working culture.

The CJS team grew quickly over a short period of time - leading to the development of less-rigorous practices and a decreased focus on team cohesion. With the team leadership not experienced with running a large group before, this has also likely affected the makeup of the team.

The divided culture was apparent, with CJS leadership choosing to focus time and resources on innovative solutions rather than core day-to-day operations, despite the CJS Director specifically assuming accountability for core operational systems. This likely contributed to turnover of CJS employees and an outward perception of an unorganised business unit with questionable delivery capability.

The sudden departure of the Director generated disruption and additional uncertainty within the CJS team. A number of CJS employees are still unclear about their current roles, the roles of others, and the authority and accountability that now exists within CJS.

There was a view that the Director had not managed a team the size of CJS before and had not adjusted well to running large groups. Although highly outcome focused, CJS’ delivery appeared haphazard and flawed due to multiple working styles, levels of detail, and unclear leadership expectations.

Due to lack of planning and directives alongside disparate contractor expertise, there are also variations in the use of tools, software language, and repositories that were brought in and are used across the unit. As concluded in \( s6(a), s9(2)(c) \), the quality of work delivered also differs across CJS and can be directly linked to the lack of technical leadership, standards of quality, work processes, and the enforcement of method discipline throughout.

During periods where projects have been subsumed by CJS, there has been a lack of accountability and acknowledgement of ownership amongst CJS leaders as to work channels, ultimate project outcomes, and collaborative expectations of teams to achieve the required results.

With the departure of the Director, Head of Operations, and Head of Software Engineering, all within a short timeframe, vision and direction for CJS is unclear. With such an abrupt change in leadership, and the uncertainty that this brings, there is confusion around who is now ultimately accountable for both innovation and core technology.

Recommendations:

Ensure CJS leadership provide a clear understanding of all processes and what is required to ensure accountability channels are clear and actionable. (L8)

Ensure that the innovation mentality of CJS operates within boundaries and is well-integrated with wider business units. (L9)

NZTA should act swiftly but carefully in determining CJS’ future and structure. The timeliness of this will assist in protecting from unwanted staff departures. (L10)

Develop a communication strategy to ensure that organisational changes are clear and well understood. (L11)

Ensure leadership expectations of the team, expected delivery styles, and outcomes are clear. (L12)

Ensure all tools, software languages and repositories are consistently applied. (L13)
responsible for programme output, and the overall direction CJS is likely to take.

**Clarity of Objectives**

With mixed delivery results and a lack of overarching delivery accountability, the CJS team lacked the unified goals and objectives required in order to reach crucial milestones, deliver on time and deliver products to an acceptable quality. Coupled with poor management and governance practices (as described in s6(a), s9(2)(c)), the lack of accountability and clarity of both wider unit and smaller programme objectives indicates that CJS’s ability to deliver on its vision is at risk.

**Recommendations:**

- Ensure that purpose, objectives and quality standards of CJS are clearly defined and communicated with all staff. (L14)
- Ensure accountability and ownership is documented and clear. (L15)
- Carry out lessons-learned workshops with the new team, and ensure decision making is transparent. (L16)
Effective financial management is the cornerstone to sustained successful operations, requiring leadership planning, commitment and discipline. At its core, the principles of good financial management require sound management decisions in order to achieve organisational goals and objectives. Such management decisions need to be aligned throughout the organisation.

Financial Management
The foundations of good financial management are as follows:

1. Planning and communication
2. Control and sound processes
3. Monitoring and reporting

To achieve
Organisational goals & objectives

The fact that CJS uses public funds means heightened accountability and expertise is required.

Compared to other areas of NZTA, CJS budgets are not material. The financial management of the business unit was complex and lacked clarity and direction compared to other larger NZTA business groups. Common themes cited during the review were of no clear lines of reporting, a lack of overall process and financial acumen, and a lack of communication and visibility.

The CJS Director often sidestepped NZTA processes to obtain results and move ahead with initiatives. This also applied to financial management within CJS. There was no direction from the Director of CJS to set a tone of adherence to financial best practices. This lack of financial leadership

Key Findings:
- Key Finding 10: Lax financial governance within CJS combined with limited accountability led to poor financial management practices and limited monitoring of CJS.
- Key Finding 11: There has been fragmented financial oversight, reducing visibility of the overall financial position and management of CJS.

Recommendations:
- Strengthen current financial management processes, including a formal review if required. Action must be taken to increase clarity and direction. (F1)
- Implement strong controls on business unit management to ensure top down financial control. (F2)
transcended into the wider team to weak financial controls and reporting mechanisms. CJS has undergone significant change in the past two years. During this time, ITS corporate technology was incorporated into CJS and the operating model shifted, bringing in new terminology and reporting lines. From a financial perspective, this resulted in a lack of clear direction related to policies and procedures for CJS staff. Some of the common themes included:

- No clear direction provided to budget managers related to establishing budgets and how their budget interacts with other areas of CJS and NZTA;
- No clear direction or aligned vision on investment decisions (including purchasing new software because it was preferable to learning an existing tool within NZTA);
- No clear processes communicated to CJS staff related to spending. CJS staff were using credit cards to make purchases that should be invoiced to NZTA; such as software tools and IT equipment;
- A lack of knowledge of SAP management and its reporting abilities;
- Coding costs to a general business unit code under urgency and later reclassifying expenses. Risking improper budget management, losing sight of project costs and additional work; and
- Regular financial management discussions were not being held beyond the Director of CJS, leaving other areas of the organisation without visibility of CJS and enforcing a siloed approach to financial management.

**Reporting**

Budgets are managed by the budget holder who may be a programme manager, product manager, operational manager or the Director of CJS. Expenditures are split between NLTP project codes and business unit running costs (or operational costs). NLTP project codes are charged directly to NLTP activity classes and operational costs are spread between activity classes. Delegation for spending and accountability rests with the budget holder and ultimately the Director of CJS. Delegations are based on specific project codes and limits are bound by project funding, rather than by the position that the authoriser may hold, often resulting in very high delegation limits.

A Management Accountant supports CJS and produces monthly financial reports to NZTA’s executive leadership team. Reports have a view of both operational and project levels and include a comparison of monthly and year-to-date budgets to actuals. The reporting prepared provides a view of cost centres in CJS except for costs sitting under TransportOS (including transport technology). TransportOS is comprised of an administration budget, NLTP operating budget and NLTP Capital Expenditure budget; each managed by separate managers. It is unclear whether these budgets roll up into one reporting structure or if the Director of CJS had visibility of CJS’ total costs, including TransportOS.

**Recommendations:**

Simplify financial reporting structures. Reporting lines and related terminology needs to be clear and consistent. (F3)

Implement team management budget setting at the beginning of each fiscal year with the support of finance. (F4)

Increase financial literacy with support from finance and other financial support areas. This could be achieved through communications campaigns, collateral, and interactive sessions on best practice. (F5)

Review data limitations and financial issues, whilst implementing a consistent coding structure and asset expenditure map. (F6)
Although CJS was supported by a Management Accountant, there did not appear to be any internal accountability for overspending budgets. The Management Accountant attempted to gain justification from the Director of CJS about budget variances for reporting purposes, but often did not get responses and resorted to using GL transaction descriptions as explanations to complete reports. Budget overruns were common making it appear that there were no consequences related to budget variances.

There is a general lack of overall process and financial acumen within CJS. Developers and Engineers with limited financial background are left to manage budgets, in some instances without direction. The approval process for budget spending was not universally understood, nor followed as evidenced by funds being transferred from one project to another to cover expenses such as software and other projects and the lack of visibility from the Management accountant and Finance created a siloed approach to budget management and reporting.

**Investment Decisions**

Budget holders have the delegated authority to authorise expenditure up to the limit of their project budget. However, it is our understanding that the Director of CJS was the central point of reference for investment decisions.

Budget managers approved operating costs up to the limit of their project costs, however all costs require a one up approval.

When considering investment decisions related to the NLTP, a business case was presented to the Director of CJS who would then bring it forward to the TGG or direct to the CE, including the finance team who manages the NLTP funding in the online fund management system, TIO.

There is a lack of visibility of investment decisions among CJS project leads, yet they largely operated on an assumption that funds would be approved, if not immediately, then eventually, so work continued regardless.

**Transport Technology**

Transport Technology represents a significant portion of all technology spend in NZTA, is critical for infrastructure projects and for the ongoing operation of New Zealand’s roading systems. Transport technology largely sits in the TransportOS portfolio and is not included in the reporting produced by the Management Accountant supporting CJS, despite being part of CJS.

There is ambiguity of what falls within the definition of transport technology, which has created ambiguity around responsibilities and reporting.

TransportOS is in the process of creating a technology roadmap to provide an overview of the programme to assist with the scope and ongoing investment and maintenance needs of transport technology.

**Recommendations:**

- Monitor CJS budgets and hold budget managers accountable for overspend. (F7)
- Ensure that CJS leadership provide appropriate guidance related to financial management. (F8)
- Ensure employees are not required to perform roles outside of their designated function. (F9)
- Ensure contractual and financial delegations are appropriate, clear and simple. (F10)
- Increase transparency and visibility over project budgets and appropriate decisions. (F11)
**NLTP Reporting**

The NLTP is purposefully structured to have flexibility to amend activity class funding limits based on changing priorities within New Zealand’s land transport requirements. This flexibility is within predetermined ranges, and costs allocated to activity classes are based on the limits of approved business cases.

In order for a system to retain flexibility, there needs to be top down financial management and accountability. Poor financial management at the foundational level of a business unit elevates the difficulty in managing variable budgets at the organisational level. CJS budget managers do not have clear expectations around setting and managing budgets, with limited visibility of how NLTP expenses flow to and from NLTP activity classes. There is a perception in CJS that funds do not need to be clearly accounted for and can be reallocated amongst activity classes if there are cost overruns.

Prior to January 2019, CJS operated as a separate business group and despite financials and budgets reported individually, there was little visibility of such reports. The smaller size of the CJS’ financials in comparison to other units created low materiality thresholds for any cost overruns. Despite CJS overspending their budget in 2017, there appeared to be limited accountability as there was another year of overspending in 2018.

Since February 2019, CJS financials have been reported as a part of wider NZTA Operations results. The fact that CJS reporting is no longer delivered on a stand-alone basis creates potential for a further lack of visibility and accountability.

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**Recommendations:**

Ensure all major capital expenditure can be identified and tracked, and that reliable data on financials is kept. (F12)

Ensure that Budget Holders understand NLTP funding, and their reporting requirements. (F13)
Technology

Key Findings:

- Key Finding 12: Existing CJS solutions and products have significant risks regarding quality of implementation, and reliance on third parties.
- Key Finding 13: Technical and architectural maturity is low, with critical technical decisions being made without sufficient regard for the required technical expertise.

With CJS’s role involving more than the implementation of larger volumes and more innovative technologies, the business unit is required to align culture, people, business structure, and daily tasks in order to foster the most suitable environment for technological development to thrive.

Because of CJS-specific management, team behaviours, and ways of working, the unit has faced a number of challenges regarding the effective implementation of CJS products, and the cost and quality of the technology platforms used. We have concerns regarding non-adherence to internal policies, standards, government recommendations and risk advice.

Shadow Technology

CJS made a number of decisions and investments in technology of its own choosing. This includes selection and implementation of their own cloud service provider. The cloud landscape has not been implemented or managed to an acceptable standard for NZTA, in terms of security handling, access management, back-ups, network design, monitoring, or cost management.

CJS selected and implemented their cloud platform of choice without following GCIO guidelines, and without obtaining the proper procurement consultation and input from Corporate Technology. With the selected vendor not currently an accredited provider of cloud services to the New Zealand Government, CJS likely did not adequately consider the implications associated with bypassing important risk-mitigation processes.

Recommendations:

CJS should put comprehensive controls in place to ensure a robust decision-making process occurs prior to the procurement of new platforms. (T1)

It is critical that important risk-prevention processes are reviewed and strongly enforced. (T2)

NZTA Leadership must make a decision as to the future use of the CJS cloud platform. (T3)

Release lists of recommended software for NZTA employees to use. (T4)
Replacement of systems with CJS-developed solutions
The substitution of existing systems with CJS-developed solutions has occurred multiple times. This alone would not be notable if it weren’t for these CJS developed solutions lacking the quality or rigor of the systems they were replacing. In both instances noted above the legacy systems are still needed in some capacity regardless.

The replacement of existing systems has been said to occur in some cases “just for the sake of it”, without asking key users, and without performing appropriate benefit and risk checks as to its suitability.

Use of personal devices and email addresses
Some CJS staff use personal devices and email addresses in order to perform official CJS work and official NZTA functions. Without management profiles monitoring what actions can and cannot be performed on these devices, NZTA data and IP is freely transferrable to the private sphere, and is susceptible to loss or illegal transfer. This lack of security, traceability, and control over this NZTA intellectual property should be reviewed and specific bring-your-own-device and email address policies enforced.

Personal registration of CJS domains
There have been instances of the personal registration of CJS domain names by CJS employees. With the connectedjourneys.co.nz URL domain name specifically registered to the CJS Director’s private email account, and other instances of related domains registered to other employees, there are risks that current and future intellectual property ownership and contractual obligations that may be breached. There has been a clear lack of management controls and processes implemented around such registration activity, with even the CJS Director involved.

Monitoring and Alerting
Another CJS technology risk is to do with its monitoring and alert management processes. Up until now, there has not been a sufficient strategy drafted regarding these processes, and despite attempts, there is not a clear organisation-wide view of how to deal with the Internet of Things and monitoring devices located throughout New Zealand.

Monitoring is not consistently implemented within CJS, with different teams using different tools, all too varying levels of success. The use of duplicate systems across is reducing the effectiveness of compiled trend and analysis of results, whilst incurring unnecessary cost.

Cyber
In light of the potential for NZTA and the road transport network to be a target for malicious or malpractice actions, steps should be taken to ensure the network is as protected as possible.

Recommendations:
Track and monitor the popularity of tools and ensure appropriate cases are made when new tools are requested. (T5)

NZTA should not allow the use of private non-NZTA email addresses for business use. (T6)
Susceptibility to malicious action

An instance of failure to secure against malicious action is the building of an internal CJS knowledge repository using third party email accounts. This repository contains detailed descriptions of the majority of extended CJS systems, and provides an important overview of NZTA’s documentation for auditing and tracking purposes. With CJS’s use of third party email accounts in the development of this repository to receive, review and send elements of the final product, security processes were not followed, and should these accounts be inappropriately accessed, confidential system descriptions may find their way to unfavourable third parties and the wider general public.

Identity and Access Management (IAM)

CJS’s Identity and Access Management processes are unstructured. There is no evidence of a coordinated focus from within CJS on IAM beyond the use of skilled-administrators using their expert judgement on a case-by-case basis. This leads to potential for human error and inappropriate use, and complicates the response to any issue. Best practice would suggest that access, particularly highly privileged access, is restricted, tightly controlled and audited to mitigate any potential risk for malpractice (intentional or otherwise), and to manage cost.

Third-Party Dependencies

There are a number of technology-specific third-party dependencies.

Recommendations:

- Develop, implement, and socialise a strategy for dealing with any potential extended outages. Develop plans to prevent this occurring, and ensure that data loss is kept to a minimum by securing copies. (T7)

- Ensure that IAMS is managed to set policies and standards. (T8)

- Ensure that all technological decisions are made by those with the appropriate knowledge and expertise to understand risks and issues that occur with each option. (T9)

- Elevate the importance of technical architecture and design planning in guiding and approving decisions relating to transport technology. (T10)
Management Controls

Processes and controls related to CJS’s IT management are inconsistent or absent. With very few processes and controls laid out clearly for employees and contractors to follow, it is very easy for processes to be ignored, missed or controls to be bypassed.

With this lack of strong IT management processes to provide the required protection or rigidity around every day IT activities, CJS employees have been able to use personal devices and email addresses, register CJS domain names under personal details, facilitate the use of unapproved cloud data storage, and replace strong existing products with lower quality CJS-developed solutions.

The lack of mature or suitable IT management processes, guidelines and specific quality, risk and benefit controls have all led to the risks and issues described previously.

Lack of Technology Governance

The lack of recording of decisions, processes, and permissions, along with the general Agile ways of working of the CJS team mean that there are many instances of the Technology Governance Group (TGG) remaining unaware of not only everyday technology risk, but even on occasion the formation of new CJS Projects. The TGG is aware of the majority of these projects, however they have not been provided with the financial or managerial tracking data required in order to oversee the successful performance of these projects.

Inappropriate Access to Private Data

Although checks and balances do exist around access to certain levels of data, CJS staff without authorisation have had access to customer and HR information. This raises the potential for delicate information to be exploited, and therefore should be reviewed, and specific guidelines put in place around access to sensitive materials.

Recommendations:

- Undertake a review on all third-party dependencies. (T11)
- Continue to build NZTA’s role as custodian and steward of data that is intrinsic to the New Zealand land transport network, such as real-time journey time prediction. (T12)
Ways of Working

Key Findings:

Key Finding 14: CJS have started NZTA’s journey to digital transformation and have initiated Agile and digital ways of working that are widely accepted as integral parts of a modern IT operating model. However, significant improvements in maturity and adherence to controls will be required to ensure outcomes are achieved effectively.

To keep up in the digital age, organisations are increasingly faced with the need to operate and deliver at speed. Agile and DevOps are powerful delivery approaches that can offer enhanced flexibility to better adapt to changing business needs. While Agile and DevOps can drive value by accelerating time-to-release, enhancing quality and reducing waste, the enterprise wide adoption of these methodologies is complex.

Agile and DevOps form part of a spectrum of delivery methods. If done right, they offer a speed and flexibility that a traditional waterfall project methodology struggles with. However, it requires the same degree of oversight and accountability as traditional approaches to working.

CJS started NZTA’s journey to achieve a digital transformation by initiating agile and digital ways of working. Embracing such approaches can be positive, albeit these ways of working have not been fully implemented in CJS.

Agile/DevOps

The CJS way of working stems from a ‘move fast and break things’ mentality. Guided by fast failure in the pursuit of high growth, the CJS team applied iterative Agile and DevOps approaches to their production of software and product development.

The CJS team were quick to separate themselves from the traditional waterfall practices that the wider organisation followed by focusing on working products over comprehensive documentation, customer-centricity, and quick change responses rather than scoping and planning. Although these contemporary methods of IT development are the preferred method of development and delivery, DevOps and overarching agile methods are inherently risky if not implemented and followed correctly.

DevOps requires particular skills and training, and the use of specific software tools, which are typically integrated together to automate as much of the development process as possible. CJS had no central practice management to define and standardise integrated tools. The result was
tools selected on an ad hoc basis resulting in a proliferation of tools with little monitoring of practice.

This relaxed approach to working led to immature controls and a high level of autonomy. This allowed CJS to avoid or sidestep processes, purchase their own IT tools and software and challenge internal barriers to progressing innovation. Should Agile or DevOps be used in the future, clear boundaries, expectations and parameters must be developed.

**Quality Management**

CJS’ ways of working coupled with a lack of oversight have created inconsistent quality management practices. A key example of this was at the deployment stage which had not been tested appropriately or checked against a structured risk go/no-go criteria and was subsequently rolled back from production after serious defects emerged.

CJS is very outcome focused which meant that previously investment was focused mainly on the build phase of work. Standardised quality checks and go/no-go assessment processes lacked uniformity and business clarification.

Quality management had been affected due to irregular engagement and consultation with key business stakeholders. By keeping other areas of NZTA at an arm’s length, key quality management functions such as the EPMO and other specialist areas such as security and privacy have not been able to provide the required level of support. This also means that appropriate levels of information have not been communicated back to CJS project teams.

Standards of quality and tool proliferation vary amongst the team’s and there are no standards in place to ensure training or uniform expectations are placed on contractors or new hires. Staff operating in different ways and using different tools is hampering efforts to perform efficient code management and development, as well as uniform quality control.

**Professional Relationships**

The majority of CJS staff have good professional working relationships with those in their teams however there is a distinct lack of consultation and communication between the CJS team and wider NZTA. A contrast in ways of working has led to a siloed practice without the cross-organisation relationships required to provide natural checks and balances to CJS processes and outcomes. Previous attempts to unify CJS with the wider organisation received pushback by the Director of CJS, however the current situation provides a good opportunity to re-establish strong professional relationships with the wider NZTA.

**Channels of Communication**

Currently, the majority of CJS remains separate from the rest of the NZTA in both a physical and administrative sense. Set up as an innovative hub, CJS purposefully kept their product development and process planning apart from the operational running of NZTA. There are currently few
avenues for information exchange between CJS and the wider NZTA, as a result, the various teams (SD&D, Operations, and CJS) do not work together as a collective unit.

Due to the close relationship between the previous CE and CJS Director, communication channels were often informal and direct, resulting in limited visibility throughout the organisation. CJS operated with what appeared to be a high level of confidentiality, with information only divulged wider on a need-to-know basis.

**Strategic Relationship Management**

CJS also holds various professional relationships with external parties such as Regional councils across New Zealand and heritage technology partners. There are three current key stakeholder groups for CJS; data providers, councils, and the private sector (key in order to access and leverage the marketplace). These relationships are held by NZTA Product Managers, however there is some concern that significant conversations and relationships are held by a very small number of CJS employees and/or contractors.

A pressing matter is the level of engagement with, and promises that have been made to all three stakeholder groups. Without formal tracking of promises made and decisions sought, reestablishment of agreements reached will be required, as will clarification of legal implications should unfavourable verbal arrangements have been made.

A listing of the CJS known relationships and their status are contained in Appendix 2.
Appendices
Appendix 1: Documents Reviewed

The following documents were reviewed over a range of NZTA projects and structures.

- Board and TGG Minutes and Agendas
- Business Plans
- Emails
- Employment Contracts
- Finance Summaries
- Funding Requests
- Investment Quality Assessment Reports
- Lessons Learned reports
- Lists of Contractors
- Lists of projects funded by the National Land Transport Fund
- Lists of software employed
- Project Business Cases
- Project Economic Cases
- Project presentations
- Project strategic cases
- Risk mitigation registers
- Supplier Contracts
- Supplier order forms
- Structure charts
- Project Timelines
## Appendix 2: Third Party Commitments/Key Relationships

The following commitments were identified in our review of CJS and further investigation is recommended.

<table>
<thead>
<tr>
<th>Commitment</th>
<th>Commitment partner</th>
<th>Details of Commitment</th>
<th>Status of commitment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Red Zone Feasibility Study</td>
<td>S6(a), S9(2)(b)</td>
<td>As of 7 March 2019, final draft of the lease agreement and contract was ready to be signed for 5 year lease (autonomous vehicle and support system testing). NZTA planning on funding road repairs for this project.</td>
<td></td>
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<tr>
<td>GRETS</td>
<td>S9(2)(b)</td>
<td>The team has transitioned from</td>
<td></td>
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<tr>
<td>Commitment</td>
<td>Commitment partner</td>
<td>Details of Commitment</td>
<td>Status of commitment</td>
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</tr>
<tr>
<td>S9(2)(b)</td>
<td>GRETS to Project Next</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Waze</td>
<td>TGG have endorsed this partnership.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MobilityOS</td>
<td>The project is not tracking well, with app development behind schedule and with far less functionality. Financials are yet to start, so are also behind. No official partnerships currently in flight other than Auckland Transport.</td>
<td></td>
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</tr>
<tr>
<td>MobilityOS - Choice</td>
<td>All suppliers listed have been onboarded to the app</td>
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<tr>
<td>Commitment</td>
<td>Commitment partner</td>
<td>Details of Commitment</td>
<td>Status of commitment</td>
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<tr>
<td>S9(2)(b)</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>MobilityOS - Ridemate</td>
<td>All suppliers listed have been onboarded to the app</td>
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<tr>
<td>RITS</td>
<td></td>
<td>RITS solution was expected to be implemented in the second half of 2019. However this has been delayed by 18 months with pre deployment testing in late 2018.</td>
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<tr>
<td>Project NEXT</td>
<td></td>
<td>Developing a request for proposal which will be shortlisted international ticketing contractors in 2019. Tenders for financial services have been issued on GETS and closed in March. Refinement of the main ticketing solution requirements with stakeholders are</td>
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</table>
### Commitment Details

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<thead>
<tr>
<th>Commitment</th>
<th>Commitment partner</th>
<th>Details of Commitment</th>
<th>Status of commitment</th>
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<tbody>
<tr>
<td>S9(2)(b)</td>
<td></td>
<td></td>
<td>continuing. The next round of engagement with the 5 shortlisted suppliers has been paused to allow time for the preferred suppliers to be a part of that process</td>
</tr>
<tr>
<td>Sidewalk labs</td>
<td></td>
<td></td>
<td>SWL visited NZ in March 2019</td>
</tr>
<tr>
<td>Auckland Transport Partnership Agreement</td>
<td></td>
<td></td>
<td>Current signed agreement with Auckland Transport for partnering agreement.</td>
</tr>
<tr>
<td>Weigh Right</td>
<td></td>
<td></td>
<td>The first Weigh Right site (Glasnevin) went live on 18 January 2019. The remaining tranche 1 sites (Paengaroa and Stanley St) have been delayed due to road infrastructure.</td>
</tr>
</tbody>
</table>
Appendix 3: Recommendations Table

The following table of recommendations comprises both ‘Key Recommendations’, and ‘Other Recommendations’. The Key Recommendations are located at the beginning of the report, whilst the Other Recommendations are located throughout the report in blue boxes along the right hand side.

This table is broken into the six core themes, with each section starting with the related key recommendations, followed by the remaining other recommendations. Please note that the key recommendations, although split into themes for this document, are overarching, and will likely have influences and impacts in other theme sections.

<table>
<thead>
<tr>
<th>#</th>
<th>Recommendation</th>
<th>Page #</th>
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<tbody>
<tr>
<td>1</td>
<td><strong>Build common understanding across NZTA Leadership on the central purpose and structure of CJS going forward.</strong></td>
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</tr>
<tr>
<td></td>
<td>• Use this consensus around purpose to make unified and aligned decisions on the right focus and structure of CJS.</td>
<td>Page 12</td>
</tr>
<tr>
<td></td>
<td>• Separate the Innovation function from operational functions to provide clearer domain and mandate. This could include shifting the focus toward building network and partnerships that deliver on the Government Policy Statement for land transport (GPS) rather than developing technology solutions in-house.</td>
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<td></td>
<td>• Review the key capabilities and the roles required to achieve CJS’ central purpose.</td>
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<tr>
<td>3</td>
<td><strong>Ensure CJS governance principles and requirements are clearly specified and understood throughout CJS so that managers understand how and when to use governance mechanisms effectively.</strong></td>
<td>Page 12</td>
</tr>
<tr>
<td>16</td>
<td><strong>Promote a culture of taking personal responsibility to deliver on the objectives of NZTA in a way that is accountable to the NZ public.</strong></td>
<td>Page 15</td>
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<td></td>
<td>• Increase awareness of whistleblowing policies and proper reporting channels to raise concerns.</td>
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<td></td>
<td>• Empower employees to feel as though they can safely challenge, call out, or escalate issues, including improper decision-making or behaviours.</td>
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Further Recommendations

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<tr>
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<th>Sub-Topic</th>
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<tbody>
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<tr>
<td>G1</td>
<td>Approval Processes</td>
<td>Enhance awareness with CJS managers of expectations relating to governance principles and requirements</td>
</tr>
<tr>
<td>G2</td>
<td>Decision Making</td>
<td>Ensure all business groups are subject to standard corporate policy and processes.</td>
</tr>
<tr>
<td>G3</td>
<td>Monitoring and Accountability</td>
<td>Review key technical and architectural decisions of CJS projects.</td>
</tr>
<tr>
<td>G4</td>
<td></td>
<td>Ensure all projects have processes and tools to produce adequate required reporting.</td>
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<tr>
<td>G5</td>
<td></td>
<td>Ensure that CJS leadership understand what they are accountable for.</td>
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<tr>
<td>G6</td>
<td></td>
<td>Ensure that managers are being held accountable for not following processes.</td>
</tr>
<tr>
<td>G7</td>
<td></td>
<td>Ensure that all staff are empowered to safely challenge questionable decision-making.</td>
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### Key Recommendation

<table>
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<th>Recommendation</th>
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<tbody>
<tr>
<td>12</td>
<td>Improve protection of CJS's Intellectual Property.</td>
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<tr>
<td></td>
<td>• Review and strengthen Intellectual Property clauses in both CJS contractor and permanent employee contracts.</td>
<td>Page 14</td>
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<tr>
<td></td>
<td>• Review device management and policy associated with 'Bring Your Own Device (BYOD)'. For example, ensuring devices are suitably cleansed by NZTA prior to employee exit.</td>
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<td></td>
<td>• Review suitability of IP repositories such as code and document management platforms used by CJS for adequate security and auditability.</td>
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### Other Recommendations

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<th>Sub-Topic</th>
<th>Recommendation</th>
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<tbody>
<tr>
<td>C1</td>
<td>Non-Adherence</td>
<td>Urgency protocols and defined checks and balances should exist, particularly in determining what constitutes an urgent matter and the extent of decision-making that can occur under this special circumstance.</td>
<td>Page 28</td>
</tr>
<tr>
<td>C2</td>
<td></td>
<td>Review investment processes to incorporate overarching standards and stage-gates to prevent exceptional investment pipelines.</td>
<td>Page 29</td>
</tr>
<tr>
<td>C3</td>
<td>Ensure that processes have clear boundaries and are straight forward</td>
<td>Page 29</td>
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<tr>
<td>C4</td>
<td>Align the delegations with industry best practice.</td>
<td>Page 29</td>
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<tr>
<td>C5</td>
<td>Consistently review team makeup and needs to determine if contractors should be offered full time positions/contractors should be replaced.</td>
<td>Page 29</td>
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<tr>
<td>C6</td>
<td>Ensure that those in charge of hiring are aware of best-practice and NZTA policies. In addition, introduce tracking of the length of time contractors have been with the organisation to enable informed assessment of roles and how they are filled.</td>
<td>Page 30</td>
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<tr>
<td>C7</td>
<td>Review conflict of interest check procedures for all staff involved in procurement decisions.</td>
<td>Page 30</td>
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<tr>
<td>C8</td>
<td>Provide strict enforcement of procurement protocol regarding competition and opportunity.</td>
<td>Page 30</td>
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<tr>
<td>C9</td>
<td>Review services provided for the monthly maintenance charge [$s(2)(b)$], and consider other regular technology maintenance payments.</td>
<td>Page 30</td>
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<tr>
<td>C10</td>
<td>Reinforce the application of conflict of interest policy and expectations to staff and contractors</td>
<td>Page 31</td>
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<tr>
<td>C11</td>
<td>Intellectual Property clauses should be reviewed and amended in both contractor and permanent employee contracts</td>
<td>Page 32</td>
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</tr>
<tr>
<td>C12</td>
<td>Review systems for enterprise auditability functions and identity and access management processes.</td>
<td>Page 32</td>
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**Key Recommendations**

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<tbody>
<tr>
<td>2</td>
<td><strong>Enhance visibility of CJS throughout NZTA by ensuring that the purpose and objectives of CJS are clearly defined and communicated with all NZTA staff.</strong></td>
<td></td>
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<tr>
<td></td>
<td>- Enhance the reporting visibility of CJS through regular engagement with other areas of the business including (but not limited to) the ELT, Technology and Finance.</td>
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<tr>
<td></td>
<td>- Ensure that the purpose and objectives of CJS are closely linked back to NZTA’s purpose and objectives.</td>
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</tbody>
</table>
Ensure internal roles and responsibilities are clearly specified and described within the employment contract.

- Role descriptions should be updated when appropriate and clearly outline expectations. Clarity should be provided related to direct lines of reporting and team structure.
- Responsibilities around standard NZTA financial management, including spending should be communicated to staff.
- Provide budget holders with financial reporting requirements and NLTP project reporting requirements. This will assist managers in gaining clarity on the use and purpose of reporting and enable better decision-making regarding scope and cost.
- Review CJS recruitment processes, and ensure that all CJS recruitment follows NZTA HR policies and best practice.

Review and prioritise programme investment and delivery resources to balance core technology and customer experience with achieving strategic objectives.

- The ITS network needs to be significantly upgraded. With the cost of upkeep continuing to grow, the replacement of this network technology will provide cost-saving benefits along with the removal of current security risks.
- Conduct a comprehensive review of programmes/products to ensure scope is achievable and aligned with NZTA objectives.

In periods of high change and growth in the technology team, ensure adequate change management is in place and employees understand changing expectations and roles.

Other Recommendations

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<tr>
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<th>Sub-Topic</th>
<th>Recommendation</th>
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<tbody>
<tr>
<td>L1</td>
<td>Roles and Responsibilities</td>
<td>Ensure roles and responsibilities are clearly specified and described within the employment contract.</td>
<td>Page 33</td>
</tr>
<tr>
<td>L2</td>
<td>Roles and Responsibilities</td>
<td>Ensure budget allocations follow projects despite changes in structure. Ensure teams are provided with information should such a change occur.</td>
<td>Page 33</td>
</tr>
<tr>
<td>L3</td>
<td>Roles and Responsibilities</td>
<td>Consistently review the makeup and needs of teams to determine if contractors should be offered full-time positions or be replaced due to new project requirements.</td>
<td>Page 34</td>
</tr>
<tr>
<td>L4</td>
<td></td>
<td>Ensure every role and project has a well communicated scope (or appropriate alternative) along with timelines of strategic events and decisions.</td>
<td>Page 34</td>
</tr>
<tr>
<td>L5</td>
<td></td>
<td>Develop reintegration and change management strategies and an implementation plan for bringing CJS back into the wider NZTA business (if this approach is taken for CJS).</td>
<td>Page 34</td>
</tr>
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<tr>
<td>L6</td>
<td>Ensure key external relationships are not held by individuals to prevent loss of relationship should employees leave.</td>
<td>34</td>
<td></td>
</tr>
<tr>
<td>L7</td>
<td>Review the number of contractor roles within CJS. Look to refine contractor roles on a specific project-by-project basis.</td>
<td>34</td>
<td></td>
</tr>
<tr>
<td>L8</td>
<td>Ensure CJS leadership provide a clear understanding of all processes and what is required to ensure accountability channels are clear and actionable.</td>
<td>35</td>
<td></td>
</tr>
<tr>
<td>L9</td>
<td>Ensure that the innovation mentality of CJS operates within boundaries and is well integrated with wider business units.</td>
<td>35</td>
<td></td>
</tr>
<tr>
<td>L10</td>
<td>NZTA should act swiftly but carefully in determining CJS’ future and structure. The timelines of this will assist in protecting from unwanted staff departures.</td>
<td>35</td>
<td></td>
</tr>
<tr>
<td>L11</td>
<td>Develop a communication strategy to ensure that organisational changes are clear and well understood.</td>
<td>35</td>
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<tr>
<td>L12</td>
<td>Ensure leadership expectations of the team, expected delivery styles, and outcomes are clear.</td>
<td>35</td>
<td></td>
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<tr>
<td>L13</td>
<td>Ensure all tools, software languages and repositories are consistently applied.</td>
<td>35</td>
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<tr>
<td>L14</td>
<td>Ensure that purpose, objectives and quality standards of CJS are clearly defined and communicated with all staff.</td>
<td>36</td>
<td></td>
</tr>
<tr>
<td>L15</td>
<td>Ensure accountability and ownership is documented and clear.</td>
<td>36</td>
<td></td>
</tr>
<tr>
<td>L16</td>
<td>Carry out lessons-learned workshops with the new team, and ensure decision making is transparent.</td>
<td>36</td>
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</table>

**Key Recommendations**

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<tbody>
<tr>
<td>5</td>
<td><strong>Ensure contractual and financial delegations are appropriate, clear and simple enough for a reasonable person to intuitively understand and apply.</strong></td>
<td>13</td>
</tr>
<tr>
<td></td>
<td>• Reinforce innovation funding controls by agreeing a governance mandate for the use of innovation funds and tightening governance to</td>
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include a quorum requirement, to reduce the risk of individual influence;

**11**

**Align the approach for capturing and reporting transport technology expenditure throughout the organisation.**

- Define the owner of transport technology and communicate this to the wider organisation.
- Work with Finance to capture and define the costs.
- Ensure all major capital expenditure can be identified and tracked, implement a consistent coding structure, map asset expenditure, and keep reliable data on financials.

### Other Recommendations

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<tr>
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<th>Recommendation</th>
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<tbody>
<tr>
<td>F1</td>
<td>Financial Management</td>
<td>Strengthen current financial management processes, including a formal review if required. Action must be taken to increase clarity and direction.</td>
<td>Page 37</td>
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<tr>
<td>F2</td>
<td></td>
<td>Implement strong controls on business unit management to ensure top down financial control.</td>
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<tr>
<td>F3</td>
<td></td>
<td>Simplify financial reporting structures. Reporting lines and related terminology needs to be clear and consistent.</td>
<td>Page 38</td>
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<tr>
<td>F4</td>
<td></td>
<td>Implement team management budget setting at the beginning of each fiscal year with the support of finance.</td>
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<tr>
<td>F5</td>
<td></td>
<td>Increase financial literacy with support from finance and other financial support areas. This could be achieved through communications campaigns, collateral, and interactive sessions on best practice.</td>
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<tr>
<td>F6</td>
<td></td>
<td>Review data limitations and financial issues, whilst implementing a consistent coding structure and asset expenditure map.</td>
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<tr>
<td>F7</td>
<td>Reporting</td>
<td>Monitor CJS budgets and hold budget managers accountable for overspend.</td>
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<tr>
<td>F8</td>
<td></td>
<td>Ensure that CJS leadership provide appropriate guidance related to financial management.</td>
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<tr>
<td>F9</td>
<td></td>
<td>Ensure employees are not required to perform roles outside of their designated function.</td>
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<tr>
<td>F10</td>
<td></td>
<td>Ensure contractual and financial delegations are appropriate, clear and simple.</td>
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<tr>
<td>F11</td>
<td></td>
<td>Increase transparency and visibility over project budgets and appropriate decisions.</td>
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### Key Recommendations

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</table>
| 9 | Develop and enforce Change and Release Management standards, with consistent quality checks performed and tested on all technology products/projects.  
   - Accountability should be on the product lead to ensure quality is proven, and an independent go/no-go criteria for acceptance should be met before any release. | Page 13 |
| 10 | Continue to build NZTA’s role as custodian and steward of data that is intrinsic to the New Zealand land transport network, such as real-time journey time prediction. | Page 14 |

**Other Recommendations**

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<thead>
<tr>
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<th>Sub-Topic</th>
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<tbody>
<tr>
<td>T1</td>
<td>Shadow Technology</td>
<td>CJS should put comprehensive controls in place to ensure a robust decision-making process occurs prior to the procurement of new platforms.</td>
<td>Page 41</td>
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<tr>
<td>T2</td>
<td></td>
<td>It is critical that important risk-prevention processes are reviewed and strongly enforced</td>
<td>Page 41</td>
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<tr>
<td>T3</td>
<td></td>
<td>NZTA Leadership must make a decision as to the future use of the CJS cloud platform.</td>
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## New Zealand Transport Agency – Review of Connected Journeys Solutions

### Key Recommendations

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<tbody>
<tr>
<td>6</td>
<td><strong>Build consensus around how NZTA aim to achieve the innovative use of technology objectives set out within the Government Policy Statement for Land Transport.</strong></td>
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<tr>
<td></td>
<td><em>Then consider:</em></td>
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<td>- What capabilities are required to deliver accordingly over the short, medium and long term;</td>
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<td></td>
<td>- Consider the balance of core vs. transformational efforts and corresponding risk appetite; and</td>
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<td>- Consider where capability would best be situated within CJS and the wider organisation.</td>
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<tr>
<td>8</td>
<td><strong>Elevate the importance of technical architecture and design planning in guiding and approving decisions relating to transport technology.</strong></td>
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### Ways of Working

| T4  | Release lists of recommended software for NZTA employees to use.                                                                                   | Page 41 |
| T5  | Track and monitor the popularity of tools and ensure appropriate cases are made when new tools are requested.                                       | Page 42 |
| T6  | NZTA should not allow the use of private non-NZTA email addresses for business use.                                                            | Page 42 |
| T7  | Develop, implement, and socialise a strategy for dealing with any potential extended outages. Develop plans to prevent this occurring, and ensure that data loss is kept to a minimum by securing copies. | Page 43 |
| T8  | Ensure that IAMS is managed to set policies and standards.                                                                                         | Page 43 |
| T9  | Ensure that all technological decisions are made by those with the appropriate knowledge and expertise to understand risks and issues that occur with each option. | Page 43 |
| T10 | Elevate the importance of technical architecture and design planning in guiding and approving decisions relating to transport technology.            | Page 43 |
| T11 | Undertake a review on all third-party dependencies.                                                                                               | Page 44 |
| T12 | Continue to build NZTA’s role as custodian and steward of data that is intrinsic to the New Zealand land transport network, such as real-time journey time prediction. | Page 44 |
• This is particularly important in relation to improving network security, integration and resilience.

**Develop lessons learned from CJS with reference to industry best practice as a way to establish a new digital foundation**

- Codify agile and DevOps processes to enable ‘freedom in the framework’ so that regardless of delivery method there is appropriate planning, tools and guidance, reporting, and governance.
- Help shift the culture from ‘start-up’ to ‘scale-up’ – focus on building process, networks and systems rather than ‘move fast and break things’.
- Standardise and de-duplicate internal tools – use the opportunity to select leading practice tools and integrate and automate where possible as part of building digital maturity.

**Invite key stakeholders to a re-launch session(s) when changes regarding technology and innovation have been agreed in order to promote new ways forward and mend or maintain current relationships.**

- Make a plan and take steps to reopen communication channels regarding technology or innovation with key stakeholders from across the sector, providing an explanation of previous activities and expectations of the future. Promote cross-collaboration in the innovation space.
- Define and broaden the roles and responsibilities required for stakeholder management.
- Key external relationships should not be held by any one individual in order to prevent loss of relationships should employee leave.

### Other Recommendations

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<tbody>
<tr>
<td>W1</td>
<td>Agile/DevOps</td>
<td>NZTA should continue on their journey to digital transformation, and should continue to develop their use of Agile and DevOps ways of working.</td>
<td>Page 45</td>
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<tr>
<td>W2</td>
<td></td>
<td>Levels of acceptable rigour should be defined in use of Agile and DevOps projects.</td>
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<tr>
<td>W3</td>
<td>Quality Management</td>
<td>Define practice management and standardise tools. These standards of quality and tools must be socialised across the business.</td>
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<tr>
<td>W4</td>
<td></td>
<td>Develop and enforce Change and Release Management standards, with consistent quality checks performed and tested on all technology products/projects.</td>
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<tr>
<td>W5</td>
<td></td>
<td>Map key stakeholders to individual projects to ensure open channels of communication.</td>
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<tr>
<td>W6</td>
<td>Professional Relationships</td>
<td>Develop a strong communications plan, along with employment of a dedicated internal communications team (if a suitable one does not already exist).</td>
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<tr>
<td>W7</td>
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<td>Apply steps to reopen communication channels with key stakeholders across the business, providing an explanation of previous activities and expectations of the future.</td>
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