Next Generation Critical Communications (NGCC)

Business Case "Light"

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Introduction

This Document

This document is intended as an edited, summarised form of the NGCC Detailed Business Case (DBC). Its specific purpose is to articulate the programme's scope, risks and assumptions in order to guide the teams engaged on the project – be they the core programme team, the agency project teams, the programme delivery partner. It may also be provided to Central Agencies and other programme oversight entities.

Financially and commercially sensitive information has been removed.

The full Detailed Business Case (DBC) with appropriate redactions may in due course be publically released with the explicit approval of the Minister of Police.

For the purposes of managing any material and substantive changes to the DBC, the programme has developed a full change control process including change control request forms and a register of approved requests.

Every effort will be made to maintain traceability with the DBC, but in the case of discrepancies or contradictions the latest approved version of the DBC, and the register of approved change control requests will take precedence.

The next substantial update to the DBC will be reflected in the Implementation Business Case (IBC) (scheduled for development and approval in late 2020/early 2021). That IBC will reflect all approved change control requests between the final DBC and the finalisation of the IBC, the outcome of the RFP process and subsequent commercial negotiations and arrangements.

For suppliers, industry participants, and other third parties, the primary reference material was published in September 2019 and is available at: https://www.police.govt.nz/about-us/publication/next-generation-critical-communications-ngcc

It is expected that in due course a full range of material will be published as part of an RFP process.

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Strategic Case: Confirming the Case for Change

Emergency Services cannot achieve their missions – to maintain law and order, keep people safe, protect life and property, and deal with health events – without the support, trust and confidence of their staff, volunteers and the wider public.

The ability of Emergency Services to communicate effectively with their frontline is fundamental to their safety and to delivering services to the community. The public expects that societal and technological changes are reflected in how Emergency Services operate, and that the tools they use are as good as, if not better than, those the community can access.

Currently the Emergency Services use communications networks that are 20 to 30 years old. They are insecure, at growing risk of failure, and they constrain the ability of Emergency Services to benefit from current technology and mobilisation initiatives.

By replacing the existing networks with a modern critical communications capability, NGCC will enable better health, crime and fire outcomes for New Zealand as information will reach the frontline quicker and in more places. By enabling new ways of working, NGCC will support healthier, safer and more connected communities and reduce inequities in the services received by urban and rural regions. NGCC will be financially and technically sustainable.

The case for change

The Programme Business Case identified the key drivers for change (challenges), investment objectives and programme outcomes using an Investment Logic Mapping process. The case for change was developed by key operational, technology and executive stakeholders representing all cross-sector participating agencies. The problems, benefits, objectives and outcomes were revisited during development of the DBC and confirmed by key stakeholders. These are set out in the following diagram:

Figure 1: Illustration of the drivers for change, investment objectives and Programme outcomes

Our current challenges

Emergency Services rely heavily on radio and mobile communications to coordinate, manage, protect and direct geographically dispersed responders and resources used in responding to the needs of our communities.

A reliable communication capability is essential for ensuring responders' safety and providing effective and efficient emergency response, law enforcement, and the protection of life and property.

Challenge one

The first challenge is that unreliable communications are endangering operations and lives. The Police-owned analogue radio network (also used by FIRE AND EMERGENCY NZ), and commercial communications networks (radio and paging) that support FIRE AND EMERGENCY NZ and the Ambulance service, are end of life. This puts them at a growing risk of failure and makes them costly and more difficult to maintain. Inherent limitations with these networks are endangering the safety of Emergency Services' personnel and the community, and limiting service delivery to New Zealanders. Existing cellular telecommunication services are not provided as mission-critical services, which means those services cannot be relied on in emergency and disaster scenarios. In summary the problems associated with Challenge One are:

- End of life communications technology;
- Unreliable communications;
- Insecure communications; and
- Limited communications resilience.

Challenge two

The second challenge is that an inability to use modern communications is hindering continuous improvements to how services are provided to the public. Emergency services' lack of access to reliable mission-critical data everywhere in New Zealand means they cannot implement nationwide improvements to services and productivity. In areas without cellular coverage, New Zealanders cannot get the same level of emergency services as those in areas with cellular coverage, because Emergency Services do not have access to their full toolsets. In summary the problems associated with Challenge Two are:

- Limited interoperability;
- Constraints on new ways of working;
- Maintaining the public's trust and confidence;
- Ensuring the health and safety of our people; and
- Ensuring a next generation of responders.

Investment objectives

Based on the challenges, the following investment objectives were developed and agreed with key stakeholders.

Investment objective one	**To provide Emergency Services with reliable access, when needed, to secure communications.**
	• Emergency Services rely on mobile communications to perform their functions while they respond to the needs of our geographically-dispersed communities. A reliable communications capability (one that is available in all locations that Emergency Services agencies operate) is fundamental. Current commercial offerings do not meet these needs. • Emergency Services need secure communications to protect the operational communications of agencies and the privacy of personal information. The new

	services will need to have a range of security options, as each agency may have different needs. • Communications services may be provided by permanent, fixed infrastructure, or on an 'as needed' deployable basis.
Investment objective two	**To meet Health and Safety requirements while delivering legislative and contractual obligations for New Zealand**
	• Emergency Services must protect the safety of their responders and the public when they perform their operational duties and respond to the public's needs. • Voice communications and messaging in all operational areas is the minimum requirement to ensure responders are safe. However, more advanced communication capability is needed to meet public expectations of service delivery.
Investment objective three	**To provide a sustainable communications capability for Emergency Services.**
	• Emergency Services' communications capability must evolve to stay current, address coverage and reliability deficiencies, and keep pace with the public's expectations. • Sustainable communications are needed that: o meet agencies' current and future needs; o are practical to adopt and are affordable; and o address technology obsolescence and risks of failure of aging equipment.
Investment objective four	**To govern the development of critical communications capability**
	• Centralised governance is needed so that: o the communications capability continues to deliver the services agencies need in the future; o agencies can use the new capability effectively; and o agencies can work together to support innovation in service delivery.

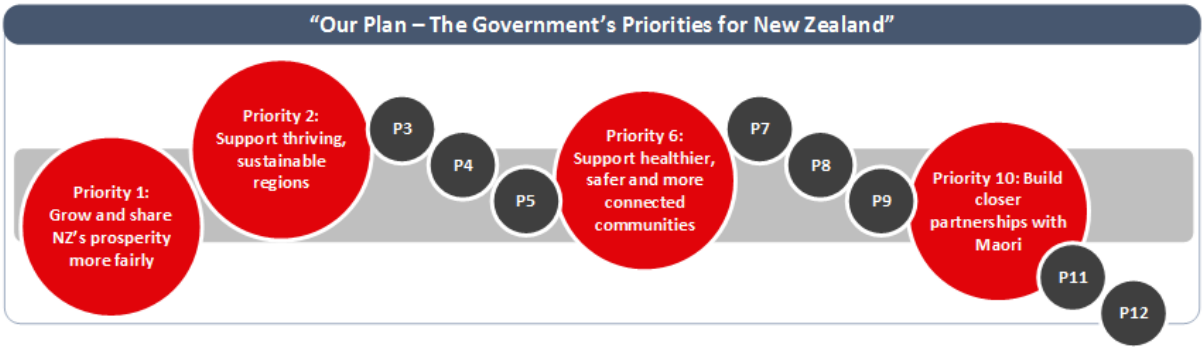
Investment outcomes and benefits

The NGCC Programme is expected to deliver the following outcomes for the Government:

- our communications capability meets operational needs;
- our communications services make our people safer; and
- critical communication services are evolving and affordable.

Strategic alignment to the Government's long-term plan and priority outcomes

In May 2018 Cabinet agreed *Our plan – the Government's priorities for New Zealand,* which has twelve priority outcomes. NGCC supports four of the priority outcomes.



Priority 1 - grow and share New Zealand's prosperity more fairly

Emergency Services are responsible for maintaining law and order, keeping people safe, protecting life and property, and dealing with health-related events at all times, especially during emergency situations and natural disasters.

Emergency Services cannot achieve their respective missions without the full support, trust and confidence of their staff, responders and the wider public. Maintaining that trust and confidence relies on the public being able to communicate with Emergency Services when under duress, and the Emergency Services being able to communicate with their frontline using reliable critical infrastructure.

Priority 2 - support thriving, sustainable regions

Wherever they live, work and play, New Zealanders and visitors (3.8 million in 2018)[1] expect to access quick support from Police, FIRE AND EMERGENCY NZ and the Ambulance services.[2] Events requiring Emergency Services response (e.g. traffic accidents, hazardous-substance spills, fires and medical events) happen in urban, rural and remote locations. However, Emergency Services' ability to provide similar levels of service across all areas is constrained by their current communications capability and coverage.

Priority 6 - support healthier, safer and more connected communities

A fundamental role of Emergency Services is to help people feel, and be, safe, healthy and happy in their homes and communities, as they know Emergency Services are there when they need them. Improving critical communications will enable better health and crime outcomes by providing first responders with information more quickly in more places. The proposed expansion of critical communications coverage will allow the public to communicate with Emergency Services.

Improved situational awareness[3], and the ability to remotely monitor the whereabouts and status of Emergency Services responders, will make responders safer.

Priority 10 - build closer partnerships with Māori

One in six Māori live in rural areas that are less likely to be covered by cellular telecommunication services (see Priority 2). People who live in these areas can't access the same level of emergency services as those in areas with cellular access.

Areas such as rural East Cape, where many of the population are Māori,[4] have particularly limited access to cellular data. This digital divide leads to inequitable medical care, child care and family violence response (see the case study: Working in rural communities).

[1] Source, MBIE visitor arrivals.

[2] The Ambulance service is St John Ambulance and Wellington Free Ambulance.

[3] Receiving regular updates on situations, as new information comes to hand, is known as situational awareness.

[4] Nine out of twenty people in Gisborne region are of Māori ethnicity (Statistics New Zealand).

Aligning benefits to Emergency Services strategies

The NGCC Programme generates direct and indirect benefits. Direct benefits arise from investing in NGCC such as security and improved resilience of future communications, whereas indirect benefits are ones that relate to changes which are enabled by the investment in NGCC.

While the indirect benefits cannot be directly claimed by NGCC, they cannot be achieved without NGCC. For example, although NGCC will extend cellular coverage in rural areas, the community will not realise the benefit of better health services in those areas without Ambulance separately investing in the deployment of telemedicine applications.

Emergency Services agencies will be individually responsible for realising the benefits which result from increased productivity and effectiveness of their operational services. Recognising that reliable communications underpin Emergency Services delivery, the benefits derived from each outcome will mostly be measured by existing agency Key Performance Indicators (KPIs).

The NGCC investment proposal aligns with the individual Emergency Services' organisational strategies.

This following section looks at which of the agencies' strategic goals the NGCC will enable and what the high-level benefits will be.

New Zealand Police

The NGCC Programme will help Police achieve each of its four strategic themes.

Police strategic themes	Benefits
Prevention First: taking every opportunity to prevent harm	• Improved situational awareness that enables resources to be directed quickly. • More resilient and secure communications.
Turning of the tide: better outcomes for New Zealand by working in partnership with Iwi	• Fast, responsive access to data in rural areas.
Safer journeys: Reducing and preventing road trauma	• Improved communications coverage with fewer black spots. • Quicker access to information by officers at the roadside.
Wellness and safety: looking after our people	• Greater ability to use communications technology to monitor staff wellbeing. • Secure communications.

Table 1: Connections between Police's strategic themes and the NGCC Programme's benefits

Fire and Emergency New Zealand (FIRE AND EMERGENCY NZ)

FIRE AND EMERGENCY NZ is currently reviewing its organisational strategy, and this review will be completed after this DBC is considered. The information on FIRE AND EMERGENCY NZ's strategic context, and its alignment with the NGCC Programme, is based on FIRE AND EMERGENCY NZ's interim operating model and strategy.

The NGCC Programme will help FIRE AND EMERGENCY NZ achieve each of its three strategic themes.

FIRE AND EMERGENCY NZ strategic themes	Benefits
Fire Reduction and Prevention	• Buildings are safer due to greater uptake of FIRE AND EMERGENCY NZ advice
Coordinated Services	• New Zealanders receive medical assistance faster • The spread of hazardous substances is contained • Fires result in less damage
Stronger engagement with Communities	• A network of trained responders means communities receive assistance more quickly

Table 2: Connections between FIRE AND EMERGENCY NZ's strategic themes and the NGCC Programme's benefits

St John

St John's strategic aims for the next five years are described in *Stepping Forward Our Plan for the Future 2018–2023.*[5] This plan identifies St John's six strategic aims for playing its part in making New Zealand communities stronger, safer and better. The NGCC capability will enable two of these aims:

The NGCC Programme will help St John achieve the following strategic aims:

St John strategic aims	Benefits
Improving the quality and equity of our services	• Patients can rely on St John to deliver the right care, at the right time, and in the right place to help improve their health outcomes • Patients who experience serious injury or illness will have better access to targeted clinical treatments to improve their health outcomes • St John's people and workplaces will be safer and healthier, and its day-to-day operations will have less impact on the environment
Building capability to innovate and adapt	• Everybody who interacts with St John will have simpler, easier and faster access to its products and services however they contact the organisation

Table 3: Connections between St John's strategic aims and the NGCC Programme's benefits

Wellington Free Ambulance (WFA)

The alignment between Wellington Free Ambulance's strategy and the NGCC Programme was assessed using the strategic priorities WFA developed during 2017/18 and the 2018/19 NASO KPIs

The NGCC Programme will help WFA achieve one of its strategic themes.

Wellington Free Ambulance strategic themes	Benefits
Better patient outcomes and experience	• Patients will receive care closer to home • Patients will be referred to a provider who best meets their needs • Emergency Department attendances will be reduced

[5] St John. (2018). Stepping forward: our plan for the future 2018-2023. Retrieved from https://www.stjohn.org.nz/globalassets/documents/ibp/stepping-forward-ibp.pdf

Wellington Free Ambulance strategic themes	Benefits
	• Emergency Ambulance Service will have greater availability for life-threatening calls • Patients experiencing life-threatening and non-life-threatening injuries or illnesses will have better health outcomes

Table 4: Connections between Wellington Free Ambulance's strategic themes and the NGCC Programme's benefits

Confirmed Programme scope

This section covers what is inside and outside the scope of the NGCC Programme.

In scope

Figure 2 illustrates the scope of the NGCC capability, the Service Catalogue available to the agencies to select from (in light blue), and inter-related agency functions. The agency functions (in orange) that can utilise the NGCC capability, are illustrated, but they are out of the scope of this Programme.

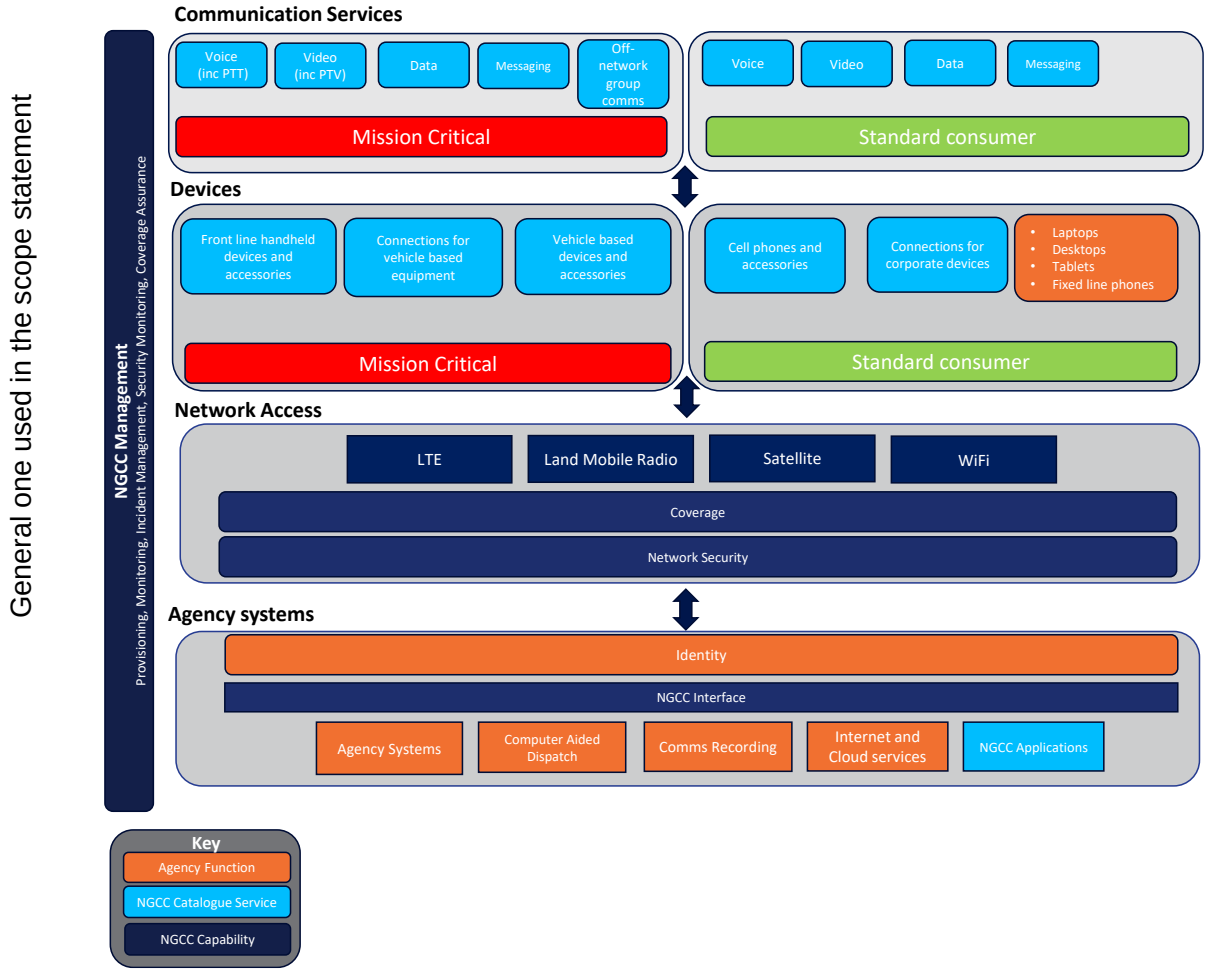


Figure 2: NGCC components

The following sections outline the scope from a phasing perspective.

Initiate phase

This phase will set up the management and governance framework for the NGCC and confirm funding for the Programme. Emergency Services agencies will document their requirements for the new service

in preparation for engaging with the market through a procurement process. During this phase the main tasks undertaken will be:

1. Approval of the NGCC Detailed Business Case and development of the initial funding bid;
2. Establishment of the NGCC Lead Entity, and governance bodies;
3. Gathering of agency requirements to inform the procurement process;
4. CIP engagement;
5. Preparation for the NGCC market engagement and procurement;
6. Assurance activities to maintain operation of existing services until full transition.

Establish phase

By the end of this phase the minimum viable product critical communications capability will be established and Emergency Services will have migrated to the new service, having embedded the NGCC capability in to their operations. The NGCC Lead Entity will have assumed responsibility for the ongoing management of the NGCC contract with the Service Provider(s). During this phase the main tasks undertaken will be:

7. Procurement of the NGCC preferred solution (establish a mission-critical communications capability as a service) by CIP;
8. Establishment of the underlying NGCC capability (including network features and functions, operational management processes and toolsets), to agreed service levels by CIP;
9. Emergency Services agencies complete integration of voice, dispatch and other core systems with the NGCC.
10. The NGCC Service Catalogue which will define the initial service-set for NGCC, will be established.
11. Security certification of NGCC services will be completed.
12. Proof-of-concept work for each NGCC service will be undertaken with users from Emergency Services agencies.
13. Operational mission-critical communications and standard cellular capability will be implemented in Police, FIRE AND EMERGENCY NZ, Wellington Free Ambulance and St John.
14. Common processes and management services to assure and enhance communications (such as accreditation of applications and service levels) will be applied and reviewed.
15. Service levels associated with the common processes and management services from the Establish phase will be confirmed.
16. Continuation of assurance activities to ensure existing communications capability remains fit-for-purpose until the transition to the new service is complete.
17. Ongoing management and operation of the new services will be undertaken by the Lead Entity and service providers.

Enhance phase

To ensure the NGCC cellular service is able to provide the reliability required to meet the needs of Emergency Services, this phase will see investment to improve the resilience of the cellular network and improve the quality of the service through expansion of coverage. By the end of this phase, the NGCC cellular service will be more resilient to failures caused by power outages and adverse events. It will have high quality, continuous coverage in the areas Emergency Services commonly operate and, in conjunction with the NGCC radio service, provide services that will fully replace legacy communications.

During this phase the main tasks undertaken will be:

18. Upgrade the backup power capability at critical cell sites via CIP;
19. Invest in new cell sites to remove black spots in high priority areas such as along state highways and tourist destinations, procured and deployed by CIP.

Evolve phase

The day-to-day focus of this phase will be ensuring the NGCC Service Catalogue evolves to meet the changing needs of Emergency Services, incorporating new technologies and standards as they emerge, in particular the emergence of satellite technologies to replace the need for radio in remote and rural areas. During this phase, agencies will no longer require their legacy communications, with commercial arrangements for these dis-established, and existing radio networks decommissioned. Agencies and the public can start to realise the benefits stated in this Strategic Case.

The ongoing governance of NGCC by the Lead Entity and service providers will enable:

- the NGCC capability to remain current;
- NGCC to evolve to incorporate new technology, such as satellite, when it is fit for purpose and cost effective;
- new services to be added to the NGCC capability as requirements evolve; and
- the NGCC capability to be expanded to other government agencies with critical communication requirements.

Out of scope

The following is out of the scope of the NGCC Programme:

- migrating non-Emergency Services onto the NGCC capability;
- implementing nationwide public access to cellular services;
- projects that will leverage the new NGCC capability to realise the indirect benefits e.g. enterprise applications, changes in business process not related to establishing core services;
- restructuring agencies;
- changing communications between the public and Emergency Services (such as the 111 service);
- changing fixed-line connections (computer networks, telephone lines, internet connections) unless they are directly required for the core NGCC services to function;
- the Programme will provide NGCC communication devices to aircraft and helicopter operators supporting Emergency Services operations. The operators will be responsible for the installation and integrating the devices; and
- replacing IT (such as enterprise applications and equipment) except the specified in-scope NGCC service items for devices, in-vehicle hubs, in-station consoles and deployable coverage.

Investment risks

Risks are uncertain events or sets of events that, if they occur, affect the NGCC Programme achieving its objectives. The main risks and their impacts, and the phase in which they are likely to occur, are set out in Figure 3.

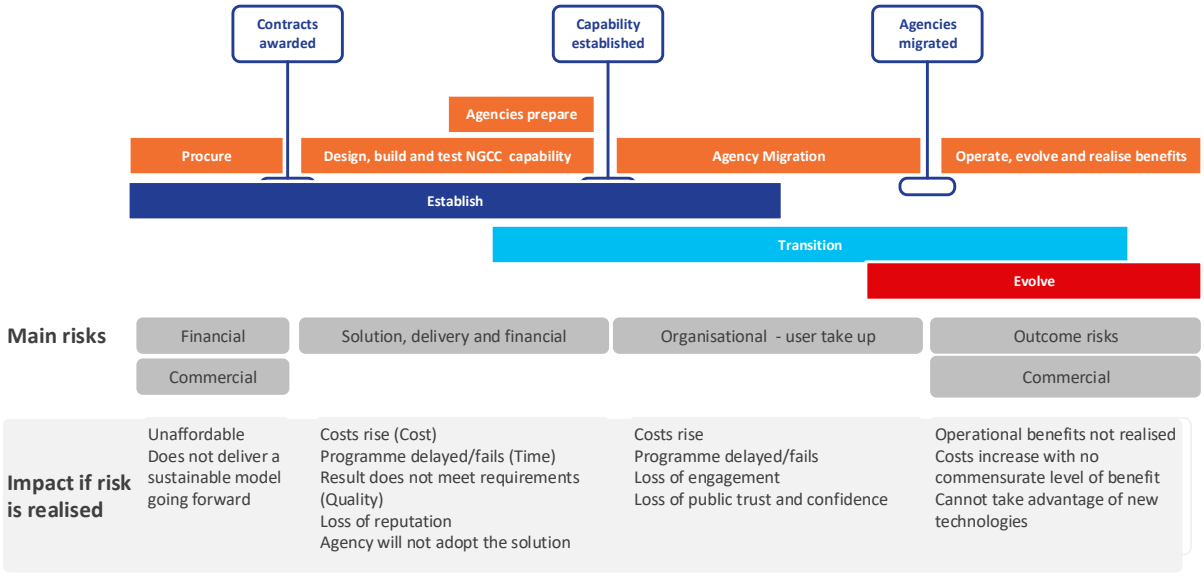


Figure 3: Main risks of the NGCC Programme and when they may occur

During the Initiate and Transition phases, the main risks relate to delivery.

During the Evolve phase the risks become more complex to manage, because they relate to ensuring the Government and Emergency Services agencies achieve the outcomes they want from the investment.

The main risk to the Government of the Evolve phase is that new capability (particularly having ubiquitous access to data) will be established but Emergency Services will not, or will only partially, use it. The likelihood of that risk occurring differs between agencies. The risk will be mitigated by:

- effective governance at a sector level, by the Lead Entity, and within each agency;
- contractual provisions that encourage agencies to adopt the capability and support its evolution; and
- assurance reviews, during the Initiate and Transition phases, to ensure that agencies are following best practice.

Constraints, dependencies and assumptions

Key constraints

The following table of constraints restrict or dictate aspects of the delivery approach for the Programme.

Constraints	Details of the constraints
Multi-agency scope	Police, FIRE AND EMERGENCY NZ and the Ambulance services have many common requirements; however, there are also agency-specific requirements. Achieving these agency-specific requirements may drive costs that other agencies will need to accommodate. Alternatively, individual agencies may have to make compromises on capability or requirements.
Economy of scale	The 2014 market sounding identified that the collective scale of Emergency Services is the minimum that will be economically viable for commercial providers. Reducing the scale, if one or more agencies does not take up NGCC, will significantly increase the costs for the remaining agencies. It could also jeopardise the commercial viability for commercial providers.
Agency operating models	Agencies will need to adapt their operating models to maximise the benefits that NGCC enables. The degree of change they need to make may prove challenging, as they have used the current generation of technologies for up to 30 years.

Constraints	Details of the constraints
Services in remote areas	New Zealand's geography means that providing communications in remote areas will be challenging and, in some areas (up to 10% of geography), not economically justifiable to provide permanent terrestrial communications. In these areas, infrastructure services may need to be itinerant, taken with field responders or service providers as needed, or provided by other services such as satellite. These temporary services may not provide a full communications capability.
Commercial service offerings	Commercial network operators will need to invest in upgrading their networks to offer the necessary services. The level and pace of their investment, and the priority they give this over their other commitments, will significantly influence the availability of capability.
Emergency Services only scope	As the NGCC Programme has been scoped for Emergency Services, it builds on existing cross-agency cooperation and collaboration. This significantly reduces the complexity of gathering requirements, service delivery risks and governance while still delivering up to 60% of the whole of Government benefits. NGCC is intended to be available to all government agencies in future. However, while other agencies will have many requirements in common with Emergency Services, they will also have unique requirements that need to be met before they can adopt NGCC. The Programme team engaged with other agencies in earlier phases to understand their high-level requirements. The agencies can also input into the NGCC through the Executive Governance Board. The NGCC concept attempts to minimise decisions that would preclude other agencies using NGCC.

Table 5: Main constraints of delivering the NGCC Programme

Dependencies

Table 6 lists the dependencies that will be carefully monitored during the Programme.

Dependencies	Details of the dependencies and strategies to manage them
Crown Infrastructure Partners expansion of cellular coverage	The Crown Infrastructure Partners RBI2 and MBSF initiatives will increase the geographical coverage of existing cellular networks from approximately 50% to 70% of New Zealand, leaving only 700km of major roads without cellular coverage.
International standards	Standards for mission-critical communications on cellular technologies are well advanced but not all key features have been agreed. The timeframe for delivering international standards for cellular services through the 3GPP framework will determine when its key features become available and how they are implemented on commercial cellular networks. User devices also depend on the standardisation process: the type and cost of specialist devices relies on wide uptake by emergency services worldwide to attract the interest of equipment manufacturers, and to achieve the volume of sales to make prices affordable.
Interoperability	To achieve interoperability benefits, Emergency Services will need to understand each other's needs for sharing information, and develop common practices and procedures for communicating with each other. For larger-scale emergencies, this requirement may include non- Emergency Services, such as Civil Defence and New Zealand Defence Force.
Commercial service enhancement deployment	Commercial network operators will need to invest in upgrading their networks to offer the coverage, resilience and features that Emergency Services need. The level of investment needed, and how much will be commercially non-viable, is still uncertain.
Agency commitment	The NGCC Programme depends on the participating agencies being continuously committed to the investment's objectives and adopting the NGCC capability.

Table 6: Main dependencies that will be monitored during the NGCC Programme

Assumptions

Table 7 lists the events or circumstances that are assumed to occur during the Programme.

Assumption type	Details of the assumptions
Cellular coverage	The NGCC Programme will not provide nationwide cellular coverage for Emergency Services or the wider community.
Baseline funding	Emergency Services will continue to make their planned contributions from baseline funding (refer to the financial case for details) for the duration of the Programme
Organisational restructure	Organisational restructures will not impact on Emergency Services agencies' commitment to use the NGCC capability at the capacity and funding levels specified in the DBC.
Government priorities	The long-term priorities of the Government will not change.
Mobility initiatives	Emergency Services will continue to commit funding (in addition to their NGCC commitments) to develop their mobility initiatives so that they realise the identified benefits which are enabled by NGCC.
Government ICT and Procurement Functional Leadership Support	Government's ICT and Procurement Functional Leads support the procurement strategy in this DBC and the NGCC indicative architecture.
APEC	Emergency Services will use existing radio services to support APEC in 2021, as the NGCC capability will not be implemented in time.
Operational demands	Large-scale events that impact on Emergency Services, such as a major earthquake, won't occur during the Initiate and Transition phases.
Service availability	Critical cellular-service features will be standardised and commercially available by the time they are needed for the NGCC Programme. (The timeframe to rollout these services on commercial networks aligns with the NGCC Programme and it will be a contractual requirement. The NGCC Programme team includes a technical specialist who will monitor progress with standards and similar initiatives. This will enable the Programme team to understand how solutions are being implemented, and ensure that any dependencies can be reflected in the delivery timeline.)
Equipment availability	Specialist equipment that can operate on cellular devices, which meets the needs of Emergency Services, will be available in time for the NGCC rollout. This requires international standards to have been ratified and worldwide demand to have increased.
Replacement of critical communications services	NGCC will replace all critical communications currently used by Emergency Services. The replacement services may not be the same type of service currently used, but will meet the same operational requirements (for example, paging).
Mobile Black Spots Fund and Rural Broadband Initiative	The Government has announced MBSF and RBI2 investments of $150M (potentially up to $250M) in expanding cellular network coverage across New Zealand. It is assumed that these investments will be aligned with NGCC's coverage requirements and use the same cellular technology. (The NGCC Programme has provided its requirements to the MBSF and suggested priority areas. The Programme will continue to work with MBIE and CIP to ensure investments are aligned.)
Radio assurance	Existing radio services will continue operating reliably until Emergency Services transition to NGCC. Necessary investments in assurance activities will be made. (Investments in assurance activities can be reduced once NGCC services are adopted. Early adoption presents an opportunity to reduce assurance costs.)
Radio site ownership	It is possible to transfer Police's ownership of sites for their existing radio networks to a service provider where the sites are in suitable locations and land owners agree..

Assumption type	Details of the assumptions
	(The number of sites that would prove suitable for the new service is unknown, but expected to be relatively small. The exact number depends on the solution chosen and the investment plans of service providers. Transferring ownership of the sites may reduce the overall cost of the Programme.)
Radio spectrum	Commercial network operators have enough cellular-radio spectrum to meet NGCC's requirements. Where spectrum is needed for special needs, it is assumed that Emergency Services will work with Radio Spectrum Management (RSM) to secure it. (All mobile communications rely on radio spectrum. Some jurisdictions have allocated dedicated spectrum for similar networks. If NGCC requires additional spectrum, it would ideally be in bands aligned with other jurisdictions.)
Critical communications service levels	Commercial service providers will be prepared to offer the service levels required for critical communications. (Service providers currently offer commercial service levels which are unsatisfactory to Emergency Services.)
Existing service obsolescence	Existing Emergency Services networks are kept operational until Emergency Services transition to the new service. (The cost of maintaining these networks is increasing, as many parts are obsolete and spare parts are unavailable. Significant investment will be needed to extend their lifespan so they continue to provide operationally-acceptable performance until 2023. Even with investment, the risk of service outages will increase. If existing networks fail, frontline operational services will be restricted and first responders will face unacceptably high safety risks. Commercial service providers are retiring services that Emergency Services rely on, such as the nationwide paging service used by FIRE AND EMERGENCY NZ, Wellington Free Ambulance and St John. The options to continue using these services will diminish over time. Investing in more assurance of these networks represents poor value for money, as the costs are escalating and the communications capability cannot be enhanced.)

Table 7: Assumptions about events or circumstances expected to occur during the NGCC Programme

Economic Case: The Preferred Way Forward

Emergency Services need to replace their existing communications so they have capability that meets their existing and evolving needs, and services that are financially and technically sustainable over the long term.

Four options for the NGCC capability were shortlisted (including the status quo baseline comparator) that considered Emergency Services' needs for mission-critical services, resilience (especially in urban areas) and network coverage. The options were differentiated by their strategic alignment, achievability, transition risk, affordability and sustainability.

The preferred option caters for voice, messaging, data and video services. It includes user devices and expands cellular geographic coverage to most places people live, work and play. Cellular will provide the primary communications method; digital radio will be an alternative method to provide resilience and offer communications where cellular services are unavailable.

The transition risk is reduced by using known technology. In future, when it is proven to be affordable and fit-for-purpose, satellite technology will replace digital radio to provide full capability nationwide.

The preferred option: Evolving mission-critical communications

Overview

The preferred option meets all investment objectives for the NGCC capability. It will realise the benefits sought while posing acceptable levels of transition and technology risk.

This option will involve procuring mission-critical voice, messaging, data and video services from commercial service providers, and operating the services on enhanced cellular and radio networks. The option includes expanding cellular coverage in areas agreed between Emergency Services and the service provider, which will be funded by this business case. A nationwide digital radio service will be procured from a commercial provider and used for mission-critical voice and messaging services. This service will provide resiliency in areas where the cellular service exists, and will be the primary network in rural and remote areas where it is not cost effective to extend cellular.

The solution will evolve to use satellite technology to replace the digital radio network once satellite is proven as an affordable and reliable platform for delivering mission-critical voice, video, messaging and data services nationwide. This evolution of the capability is essential if all the Strategic Case benefits are to be achieved nationwide.

Mobile devices and in-vehicle communications systems will be the main ways that field-based users access applications. Using in-vehicle communications hubs will improve performance in areas that have marginal cellular coverage. The hubs will also make it easier for users to access services as they reduce the number of devices they need.

This preferred option uses a pair of communications technologies (primary and alternative):

- primary technology – cellular services with mission-critical enhancements that deliver mission-critical voice, data, video and messaging; and

- Alternative technology – digital radio that delivers mission-critical voice and messaging, which evolves to satellite services that deliver mission-critical voice, data, video and messaging.

Services will be delivered to Emergency Service Communications Centres and other command centres, and integrated into core agency communication and information systems.

To develop the preferred option, the Programme engaged with industry experts through the RFI, international conferences and meetings with international subject matter experts. The inputs from other agencies and international organisations that have already built, or are building, similar NGCC networks were helpful for developing New Zealand's preferred model. In particular, the US (FirstNet), UK (ESN) and South Korea (SafeNET) have followed similar technical paths.

The design will follow relevant NZ Government standards (especially the NZ Information Security Manual) to ensure the services are secure and fit for purpose in the New Zealand environment.

The Commercial Case: Achieving the outcome

Emergency Services need critical-communications services that meet current needs and will evolve over time, responding to technology, society, and operational changes.

The market is expected to continue to evolve standard commercial products. Using these products, as far as practicable, will reduce Emergency Services' need for continual reinvestment. Instead, its investment can then be selectively targeted to its specific needs.

Existing commercial arrangements do not support evolution or incentivise service providers to invest in the specific products and features that Emergency Services need.

Appointing new service providers for cellular and radio services will establish commercial relationships through which services evolve by design, costs are sustainable and predictable, and Emergency Services can target its investment in the specific products and services they need for their individual objectives.

Required Services

The DBC outlines Emergency Services' preference to move away from owning and operating communications networks, towards purchasing a common capability in critical communications. This approach has been used to specify the goods and services that need to be purchased. These will be available for Emergency Services to purchase via a common Service Catalogue. Some elements (such as integration services) may be shared where agencies use shared platforms such as computer-aided dispatch (CAD).

Required Services	Description
Mission-critical voice	• Reliable, secure, Push to Talk service for group calling, 1-to-1 calls. • Availability, coverage and performance SLAs will apply.
Mission-critical messaging	• Reliable, secure, messaging service. • Availability, coverage and performance SLAs will apply.
Mission-critical video	• Reliable, secure, video service. • Availability, coverage and performance SLAs will apply.
Mission-critical data	• Reliable, secure, data service. • Availability, coverage and performance SLAs will apply.
Location information	• Ability to append GPS location information to mission-critical transmissions and standard cellular services.
Standard cellular services	• Appropriate services for non-operational roles.
Coverage	• Expansion coverage in agreed locations.
Resilience	• Resilience levels for agreed sites; batteries and communications links to meet agreed service levels as part of establishment of services (or as an ongoing addition where required).
Deployables	• Agreed quantity, type and stored location of deployables held by service provider or Emergency Services as agreed.

Required Services	Description
	• Agreed procedures for disasters.
Devices	• Catalogue of fit-for-purpose devices and accessories including cellular, radio and converged devices, tablets, Mobile Data Terminals and next generation pagers.
Vehicle communications hub	• Catalogue of fit-for-purpose in-vehicle systems to extend coverage, and provide access to multiple networks via localised cellular, Wi-Fi and radio extensions for devices to connect to. • Will include equipment, aerials and fit-out. • Will evolve to support satellite as an alternative network in the future.
Communication Centre services	• Software console and/or integration to third party software consoles that supports access to mission-critical voice, video, messaging and data services. • Integration of these same services to CAD systems.
In-station services	• Local radio console software and hardware that integrates to mission-critical voice, video, messaging and data services.
Integration	• Design, build, support and ongoing maintenance / project work will be required for all integration points including CAD systems, consoles, operational applications and other networks.
Support	• End-to-end support of all services provided by the service provider(s), and agreed grey area / integration support. • Ability to have enhanced support levels for mission-critical services including appropriate courses of action to be taken in disaster scenarios.
Online provisioning and device control	• Systems to allow Emergency Services to control devices in the event these are misplaced or stolen and to allow technical staff to configure devices based on specific user requirements, for example police versus ambulance vs FIRE AND EMERGENCY NZ users
Real-time network status	• A high level of visibility of the cellular operator network to manage planned outages and to quickly notify Emergency Service staff and responders of unplanned outages. Agreed service level agreements (for example network outages) would need to be managed and any commercial agreements / compensation for outages monitored using these systems.
Applications store	• A platform for the latest pre-approved and standardised applications for Emergency Services. This includes current applications like OnDuty and RSA[6] (security token) as well as future applications possible with NGCC.
Application certification services	• A process to review applications and ensure they are appropriate for use by Emergency Services, will technically work in the eco-system, meet security requirements and can be offered through the applications store.
Device certification	• A service to validate that devices will work correctly on the network, will meet security requirements and integrate appropriately into the eco-system.

Table 8: Goods and services required by the preferred option

[6] Security token to support remote access to agency enterprise systems.

Financial Case: Ascertaining affordability and determining funding requirements

The preferred option delivers a sustainable operating model with known annual costs and avoids the need for large periodic capital investments.

The investment approach is a combination of up-front investment and ongoing recovery from service fees, improving affordability for Emergency Services and encouraging wider adoption in the future.

Funding the programme involves four investment decisions. The first investment decision confirmed funding in Budget 2019 of $15.000 million to initiate the Programme. The second investment decision to commence the Establish phase will be at the approval of this DBC and presented in Budget 2020. The third decision for the Enhance phase will be presented in Budget 2022, while the final investment decision in Budget 2024 will be required to commence the Evolve phase. These investment decisions provide Government with options to change or stop further investment in the Programme.

Management Case: Planning for a Successful Delivery

The Programme requires leadership and governance to ensure the NGCC capability is delivered, critical communications evolve and keep pace with technology, and the investment provides the Government with value for money.

The Programme will be delivered in four phases: Initiate, Establish, Enhance and Evolve. A Lead Entity will be established as a business unit within Police, accountable to the Oversight Ministers for delivering the investment outcomes. The Executive Governance Board (EGB) will govern the Lead Entity and oversee the Programme's strategy and direction. A Programme Control Board (PCB) will manage the Programme during the Establish, Enhance and Evolve phases. It will provide cross-sector leadership and ensure the investment objectives are delivered. The EGB and PCB will include representatives from Emergency Services. Participating agencies will be responsible for adopting the NGCC critical communications capability and managing their change processes.

During the Establish phase, radio and cellular services will be procured, agencies will prepare for change and the Lead Entity structure will be finalised. During the Enhance phase, agencies will procure NGCC catalogue services and devices, transition their operations to the NGCC capability and end their existing radio and cellular agreements.

Organisation

The Programme Business Case (PBC) recommended that delivering and managing modern critical communications should be centrally governed, so that capability development was sustained, the investment was optimised and the Government received the best value for money. FirstNet in the US and SafeNET in South Korea use this approach, which focuses on governing the evolution of the capability.

To successfully deliver the investment objectives, the delivery organisation needs a good understanding of the requirements and core business of Emergency Services and other government agencies. The delivery organisation must be able to perform the following organisational and management functions:

- coordinating the governance, management and delivery of the capability;
- being accountable for the capability's leadership and governance;
- making independent decisions related to the investment;
- consolidating the sector's critical communication requirements;
- developing critical communication expertise for related to mission-critical services;
- managing government funding in a cross-sector context;
- developing common standards for the capability;
- managing relationships with the service providers;
- managing contractual arrangements, specifically the Service Catalogue and Master Contracts; and
- leading the capability's evolution and its adoption by other government agencies.

Programme structure

This section outlines the proposed Programme structure and describes the roles and responsibilities of key functional and governance groups. Police will host the Lead Entity as a business unit, and will provide hosting services such as human resources and ICT.

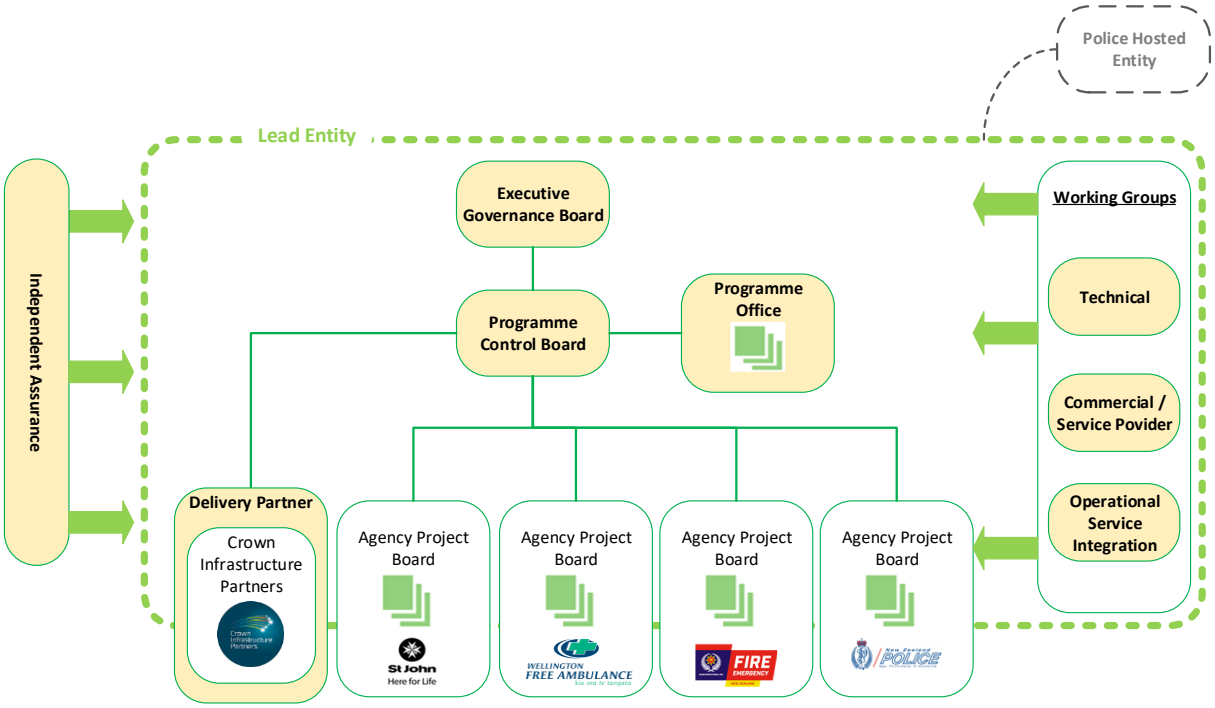


Figure 4: Organisation structure showing functional groups

The Lead Entity structure is shown in Figure 4 above. The functional groups within the structure includes two governance groups with the following functions:

- The Executive Governance Board (EGB)

  The EGB operates at a strategic level. It governs the Lead Entity and is accountable to the Oversight Ministers for investment outcomes and the ongoing evolution of NGCC.

- the Programme Control Board (PCB)

  The PCB operates at a tactical level. It is accountable for successfully delivering the Programme by establishing the NGCC capability. The PCB will oversee the transition of Emergency Services to the new capability, and will assure existing radio networks until transition is complete.

The Programme Office will oversee the Lead Entity's day-to-day activities and perform secretariat duties for the EGB and PCB.

Independent assurance across the Programme will be provided through an agreed Assurance Plan.

Each Emergency Service agency will establish an Agency Project Board (APB) that will govern the agency's transition to NGCC and ensure the agency realises the expected benefits. Each APB will oversee the outcomes, deliverables and finances of their agency projects. APBs include representation from the Lead Entity but operate outside it.

The structure will also include working groups. These will focus on specific Programme tasks such as technical designs and standards, operational integration across the sector and commercial management.

Executive Governance Board

The Executive Governance Board (EGB) is responsible for delivering the outcomes of the NGCC Programme and ensuring the Lead Entity operates effectively. The SSC, in consultation with the Oversight Ministers, will appoint the EGB Chair and specialist members.

The EGB voting members include the Chair, the Police Commissioner and Chief Executives of FIRE AND EMERGENCY NZ, Ambulance services and the Ministry of Civil Defence and Emergency Management (MCDEM), and independent technical, commercial and international specialists.

The EGB supporting members will include the Lead Entity Director and representatives from The Treasury. Supporting members will not have voting rights.

The membership of the EGB is shown in **Figure 5**.

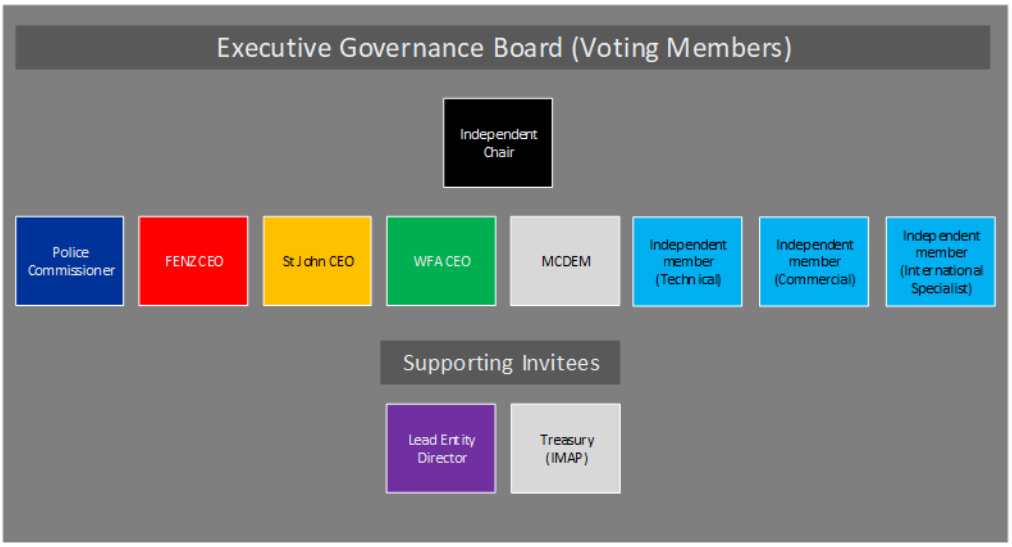


Figure 5: EGB membership

A Terms of Reference for the EGB and its members are being prepared for the Oversight Ministers to approve.

The EGB structure will be reviewed at the end of the Transition phase during step two of the SSC's recommended two-step process to establish the Lead Entity and evolve its functions over the lifetime of the Programme.

The purpose of the EGB includes:

- determining the Programme's mandate;
- setting the Programme's strategic direction;
- providing oversight and endorsement of all significant Programme contractual commitments;
- reporting to Oversight Ministers;
- approving Programme change tolerances (scope, time and cost) delegated to the PCB;
- approving major change requests raised by Programme Control Board (PCB);
- endorsing Ministerial investment decisions and budget bids for funding; and
- establishing working groups.

The EGB appointments process and accountabilities of EGB members are described in the Governance section of the Management Case.

Programme Control Board

The Programme Control Board (PCB) is responsible for ensuring the Programme is effectively managed, and delivers the required outputs to agreed timeliness, quality and cost measures. The PCB oversees the Programme's activities and individual agency projects to ensure they align with the NGCC strategy and Emergency Services sector.

The purpose of the PCB will include:

- resolving directional and tactical issues between the Programme and agency projects;
- managing major risks to meeting deadlines, quality and budget, and proposing relevant treatment strategies;
- ensuring alignment of projects across the Programme;
- using their influence and authority within their agency to assist the Programme to achieve its outcomes; and
- promoting collaborative working across Emergency Services.

The membership of the PCB is shown in **Figure 6**.

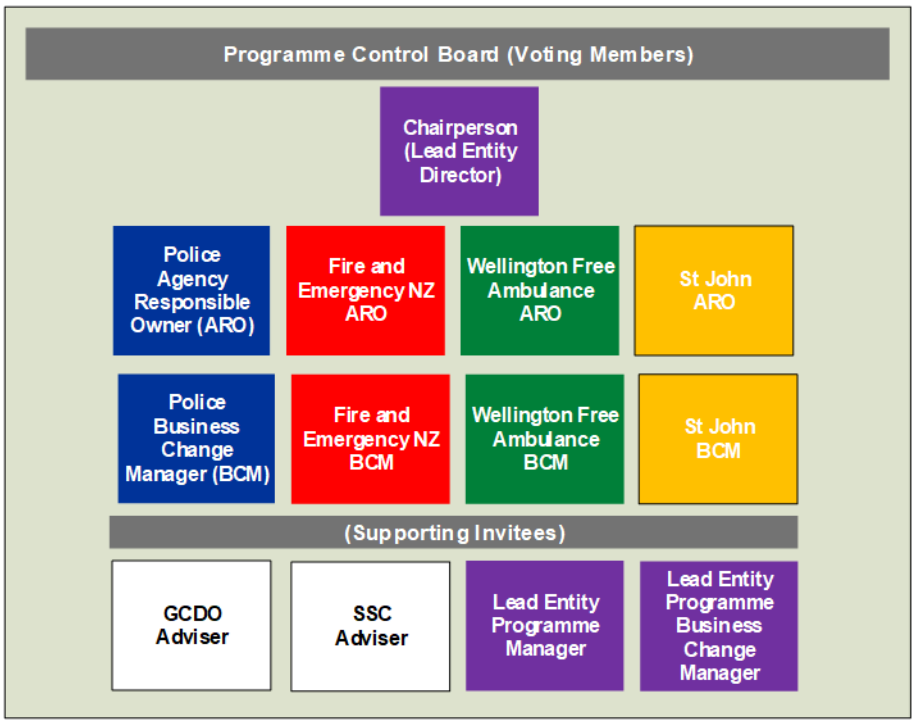


Figure 6: PCB membership

Supporting invitees from the Programme and central government agencies will attend meeting but not having voting rights. These non-voting members of the PCB will be:

- Lead Entity Programme Manager;
- Lead Entity Programme Business Change Manager;
- The Government Chief Digital Officer (GCDO) in an advisory capacity; and
- A State Services Commission senior governance advisor, in an advisory capacity.

The PCB appointments process and accountabilities of the SRO are described in the Governance section of the Management Case.

Programme Office

The Lead Entity will carry out Programme Office functions on behalf of the PCB.

The purpose of the Programme Office will include:

- managing the scope of Programme-level services;
- managing the Programme's finances;
- managing the Programme's risks and issues;
- managing changes to the Programme;
- managing the Programme's quality assurance and external reviews;
- owning the Programme's master schedule and managing dependencies;
- being the secretariat for the EGB and PCB; and
- engaging stakeholders.

Agency Project Boards

Each agency will establish an Agency Project Board (APB) to oversee, manage, co-ordinate all aspects of the NGCC projects, including radio assurance within their agency. The purpose of the APB includes:

- developing agency NGCC requirements;
- managing assurance projects for existing communications;
- resourcing agency projects;
- integrating agency core systems to the NGCC;
- conducting agency business acceptance testing with NGCC; and
- ensuring successful business change management to transition their agency to NGCC.

Each agency will have an Agency Responsible Owner (ARO). The AROs will appoint a Project Director, to manage the projects within their agency, and a Business Change Manager (BCM), to implement the changes in the agency that are necessary for realising the NGCC benefits.

Crown Infrastructure Partners

Crown Infrastructure Partners (CIP) will be the delivery partner for the NGCC procurement and establishment, leveraging their experience and relationships with telecommunications service providers to successfully procure the NGCC infrastructure and core network capability from the market.

Working groups

Three working groups will be convened by the Lead Entity:

- technology working group;
- operations integration working group; and
- commercial / service provider working group.

The purpose of the working groups is to ensure that Emergency Services work together, and to influence the NGCC having common approaches to technology, commercials and operations.

The Lead Entity will direct the working groups to provide the Programme with a common framework of ideas and knowhow. The working groups will provide advice and recommendations to the Programme and Emergency Services.

Independent assurance

The NGCC Programme Assurance Plan has been agreed with the GCDO. The assurance approach focuses on the Programme's Establish phase, and will be reviewed, and updated if required, when subsequent phases start.

The overarching objective of quality assurance is to provide the Lead Entity and key stakeholders with confidence that the Programme's outcomes are achievable and that risks are being managed appropriately.

The assurance approach will be a combination of 'real-time' ongoing assurance and, when merited, formal independent assurance reviews.[7] Reporting on the ongoing assurance of the Programme and agency projects will be provided to Oversight Ministers.

The Programme has completed Gate 0/1/2 Gateway Reviews, entry and exit Corporate Clinics, an Independent Quality Audit (IQA) and a Technology Quality Audit (TQA).

Once the Programme is transitioned from Police to the Lead Entity, a four-level quality assurance approach will be used:

- Level 1: gateway reviews are reported to the EGB Chair and Oversight Ministers to support investment decisions;
- Level 2: independent quality reviews or technical quality assurance are reported to the EGB Chair and PCB Chair to support decisions at major gates and key milestones;
- Level 3: reviews and advice from the Treasury corporate centre are reported to the Lead Entity Director during each phase; and
- Level 4: advice from the Treasury Corporate Centre, internal specialists or external experts on aspects of the delivery process is reported to the Lead Entity Director and AROs.

Programme management

So far the Programme has used Police's programme management framework, which is based on the Project, Programme and Portfolio Management (P3M) Framework. P3M can be tailored to different project sizes. When the Programme transfers to the Lead Entity, the Lead Entity can use its preferred programme management methodology, but it may consider using P3M for continuity.

Each agency will use its own project management structures and processes to govern their own projects, but they must align with controls within the Lead Entity programme management methodology.

[7] Wherever possible, reviewers will be independent of the Emergency Services agencies.

Programme milestones

These will be monitored by the PCB during the Establish and Transition phases, and by the Lead Entity in the Evolve phase. Further milestones will be identified for the Transition and Evolve phases as part of the investment case revalidation process.

<table>
<tr><th colspan="5">Key milestones</th><th>Timeframe to complete</th></tr>
<tr><td>Initiate</td><td colspan="4">DBC approved by Cabinet
Investment Decision - Mandate to continue Initiate phase</td><td>Q4/2019</td></tr>
<tr><td></td><td colspan="4">New Lead Entity established</td><td>Q1/2020</td></tr>
<tr><td></td><td colspan="4">Budget 2020 proposal approved
Investment Decision – Mandate to commence procurement</td><td>Q2/2020</td></tr>
<tr><td>Establish</td><td colspan="4">Capability establishment</td><td></td></tr>
<tr><td></td><td></td><td>Digital radio</td><td>Cellular for MC-data</td><td>Cellular for all MC Services</td><td></td></tr>
<tr><td></td><td>Contract signed</td><td>Q2/2021</td><td>Q1/2022</td><td>Q1/2022</td><td></td></tr>
<tr><td></td><td>Capability established</td><td>Q3/2022</td><td>Q3/2023</td><td>Q1/2024</td><td></td></tr>
<tr><td></td><td>Acceptance testing complete</td><td>Q4/2022</td><td>Q4/2023</td><td>Q2/2024</td><td></td></tr>
<tr><td></td><td colspan="4">Check Point – Ready for transition
NGCC integration and business acceptance testing complete</td><td></td></tr>
<tr><td></td><td colspan="4">Agency Transition to NGCC Services</td><td></td></tr>
<tr><td></td><td>Agency</td><td>Using MC-Voice (alternative Network[8])</td><td>Using MC-data</td><td>Using MC- Voice (fully resilient)</td><td></td></tr>
<tr><td></td><td>FIRE AND EMERGENCY NZ</td><td>Q1/2023</td><td>Q2/2024</td><td>Q2/2025</td><td></td></tr>
<tr><td></td><td>WFA</td><td>Q3/2023</td><td>Q4/2023</td><td>Q3/2024</td><td></td></tr>
<tr><td></td><td>SJ</td><td>Q1/2023</td><td>Q2/2024</td><td>Q2/2025</td><td></td></tr>
<tr><td></td><td>Police</td><td>Q2/2024</td><td>Q1/2024</td><td>Q1/2025</td><td></td></tr>
<tr><td></td><td colspan="4">FIRE AND EMERGENCY NZ/ St John (SJ) exits existing radio network</td><td>Q1/2024</td></tr>
<tr><td></td><td colspan="4">Police exit existing radio network</td><td>Q2/2025</td></tr>
<tr><td>Enhance</td><td colspan="4">Budget 2022 proposal approved
Investment Decision – Enhance phase</td><td>Q2/2022</td></tr>
<tr><td></td><td colspan="4">Contract signed</td><td>Q2/2023</td></tr>
<tr><td></td><td colspan="4">Coverage expansion and resilience implemented</td><td>Q2/2025</td></tr>
<tr><td>Evolve</td><td colspan="4">Budget 2024 proposal approved
Investment Decision – Evolve to satellite</td><td>Q2/2024</td></tr>
<tr><td></td><td colspan="4">Satellite acceptance testing completed</td><td>Q4/2024</td></tr>
<tr><td></td><td colspan="4">Full NGCC capability available nationwide</td><td>Q2/2025</td></tr>
</table>

Table 9: Programme key milestones (Dates are for calendar year quarters (not Financial Years).

Oversight and reporting

The EGB Chair will provide a formal report back on status of the Programme to the Oversight Ministers on a quarterly basis. The formal report back will focus on achievement of the investment objectives, financial well-being, investment risks and significant delivery issues for information or advice purposes. The EGB Chair and Lead Entity Director will meet with Oversight Ministers to present the report and review programme progress.

An annual report back will be provided to Cabinet on the progress of the Programme. This report will include mandated reporting requirements, such as the reporting of benefits realised (once NGCC features go into service).

The Lead Entity Director and EGB Chair will meet with the Lead Minister every month to discuss the delivery progress of the Programme. The Lead Entity Director will provide a progress report for the Programme which will be provided for information purposes to all Oversight Ministers. The report will focus on the delivery status of the programme, delivery risks and significant issues for advice or information purposes.

The EGB will meet a minimum of every quarter to review progress of the Programme at a strategic level. The Lead Entity Director will be responsible to provide the EGB with a formal report back.

The PCB will meet on a monthly basis to review the delivery status and progress of the Programme. The Lead Entity Programme Manager will be responsible for providing a Programme status report and the AROs a summary report on the status of their agency projects

Change management

Effective change management will be a key part of the Programme's success and achievement of the expected benefits. The Programme's two main change management initiatives will be establishing the Lead Entity and transitioning Emergency Services to the NGCC capability.

Agency business changes during transition

Each agency will run its own projects to transition to the NGCC capability, including implementing business changes within their organisations. The Lead Entity will support the change process.

Figure 7 shows the business-change steps that Emergency Services agencies need to implement during their transition projects.

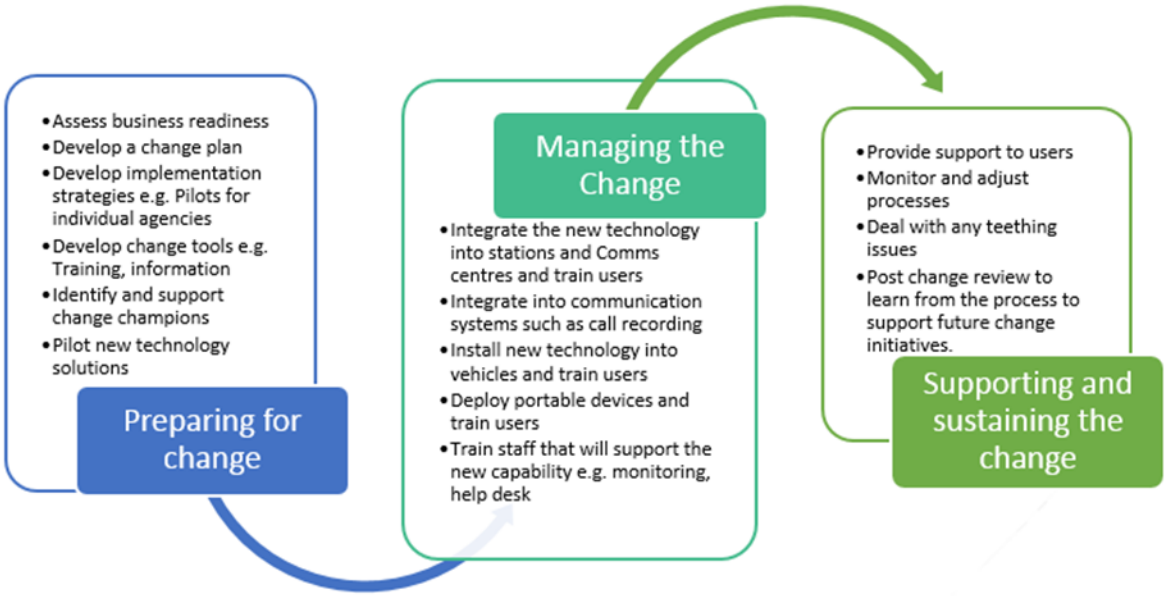


Figure 7: Business change steps

The business change process will be designed to help agencies feel supported and confident about transitioning to NGCC. To minimise the risks of change, the process will include the following elements: full executive organisational support; staff communications; user training; core-systems integration; revised service operational procedures and business continuity processes that incorporate NGCC, and business acceptance testing.

Experience gained from recent communications technology transition projects (such as Wellington Free Ambulance moving to the digital trunked network in Wellington) will inform the NGCC transition projects.

Benefits management

The Strategic Case identified the direct and indirect benefits that the Programme will deliver. The Lead Entity will develop a benefits management plan that describes how the Programme will oversee the intended benefits being realised.

The Lead Entity will ensure the participating agencies have implemented a management function to identify, define, plan, track and realise business benefits.

The proposed benefits outlined in the strategic case are an initial position for each individual agency. The ARO is ultimately accountable for the tracking and realisation of benefits for their agency. The BCM is responsible for the realisation of benefits. Agencies will update their benefits baseline in consultation with the Programme and agreement with the PCB.

Risk management

Risks arise because of limited knowledge, experience or information, or from uncertainty about the future. They can also arise when relationships between parties change. Risk management is a structured way of identifying and analysing potential risks, and devising and implementing appropriate responses. These responses generally draw on risk prevention, risk transfer, impact mitigation or risk acceptance strategies.

Risks will be identified and managed continuously throughout the Programme. The Programme will initially use Police's Organisational Risk Approach[9] under the P3M Framework.

[9] New Zealand Police. (2015). *Police organisational risk approach*. 2nd Edition v2.0.