

# Inputs towards the Development of New Zealand's ICT Strategy



Sunit Prakash MBA, Member NZ IT Professionals, Chartered IT Professional

[sunit@sunit.co.nz](mailto:sunit@sunit.co.nz)

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Wellington

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## The Backstory

### Interest on Twitter

On 21<sup>st</sup> October 2017, Rod Drury tweeted he was planning to work with the new government on:

- Office of CTO
- Retail Payments
- eInvoicing
- B2G acceleration

And that it would be good to kick off with a NZ Tech Plan. In response I suggested a couple of overseas ICT models, notably Canada and Malaysia, both of which generated interest and comments.

### The Meetup

On 16<sup>th</sup> November 2017, Dave Moskovitz organised a Meetup to do with Government as a Platform and GovTech Acceleration.

Pia Waugh from DIA's Service Innovation Lab (LabPlus) drew up a chart showing government and the way it works going across reasonably flat, and complexity of the life of citizens going up exponentially. The gap between the two was the opportunity of what needed to be addressed to better serve the people.

Here is the picture she drew up:

Brett Holland from CreativeHQ spoke of GovTech Acceleration, examples, successes, lessons learned and GovTech 2018.

### Hon Claire Curran and her address at NetHui and ITP Wellington

Although I did not attend either address, I saw a FaceBook recording of Hon Claire Curran's address to ITP members in Wellington of 20<sup>th</sup> November, and read what was reported on social media on her NetHui address of 2<sup>nd</sup> November.

Hon Clare Curran reiterated her commitment to a CTO, and clearly by the kind of questions coming at her it was clear that not only was there a lot of work to be done in a very short period of time, and so also a lot of consultation.

### Purpose

While there are many initiatives on the go, they seem to be disjointed, lacking in an overall strategy and framework.

The purpose of this paper is to provide inputs, examples, thoughts, ideas and considerations - to help the new minister and her new CTO scope, estimate, resource and help inform New Zealand's new ICT Roadmap, Model & Strategy.

## Initial Thoughts & Observations

That there were a number of initiatives and discussions either planned or under way, but they seemed to be disjointed, in silos, lacking in cohesion, direction and framework.

That there are a number of overseas examples of national Digital & ICT strategies, frameworks & roadmaps, that they contain the aspirational values of the country and provide the link as to how ICT will achieve them – we could learn from these examples.

That while there is a NZ ICT Strategy, it needs to be refreshed. I have discovered this is already under way – though the new CTO may have a view on this before it is released.

That there are non-ICT examples within New Zealand that could possibly be put to use; if not the frameworks, then the brains that created them.

That there are a large number of stakeholders across a wide spectrum, each with their own perspectives and drivers, and they need to be identified and consulted for their inputs.

That without a doubt, the role of the CTO will have to be properly scoped, and that if the CTO is responsible for technology infrastructure, then we will need a team responsible for: applications & digital channels, data, interoperability, security, strategy & architecture, governance, finance, operations including programmes, change, stakeholder management and communications.

That when we pull all of these together, we could have a strategy, a roadmap, a framework, a radar map linking social priorities with ICT initiatives outlining the players in the mix.

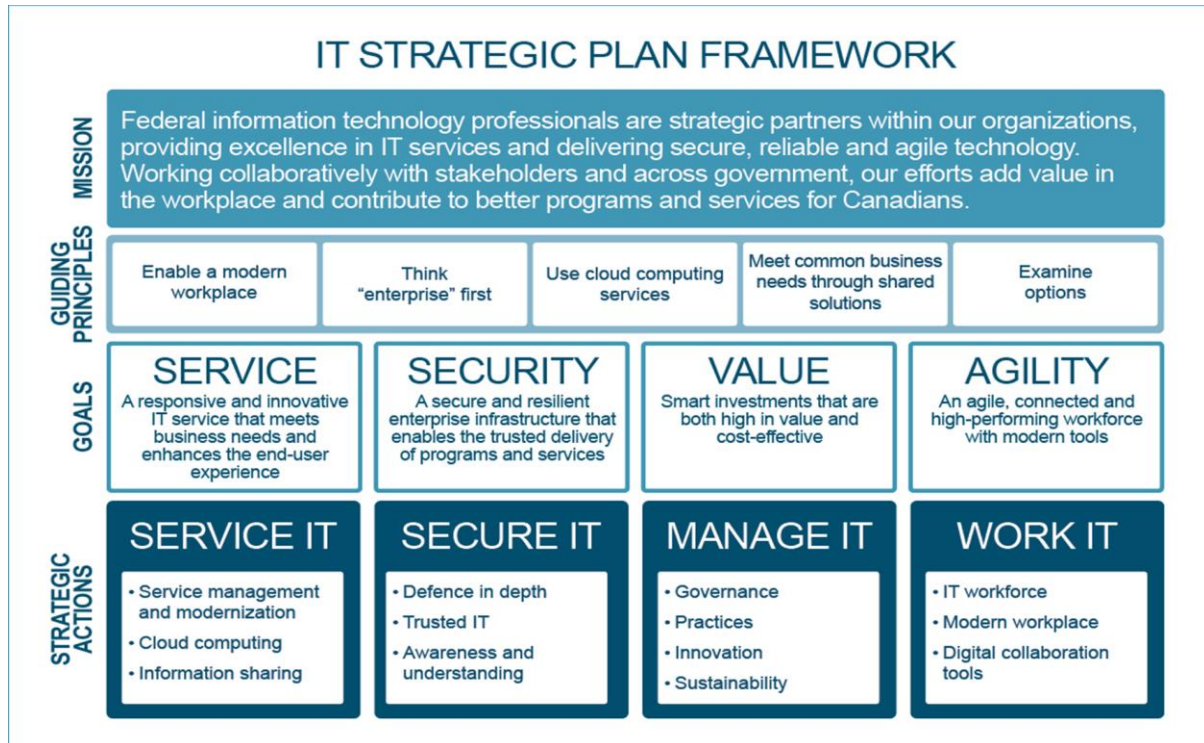
Here are my inputs towards the development of New Zealand's ICT Strategy for the Hon Clare Curran to consider.

## The Approach of this Submission

1. Showcase relevant examples of national ICT Strategies & Roadmaps from overseas
2. Reference existing Architecture Models and Frameworks as candidates for use
3. Look at UN's priorities as an example
4. Look at the priorities set out by the New Zealand government
5. Draft list of stakeholders as an example for consultation, joining the dots with, and for collaboration
6. Taking the Education sector as an example, roughly mapped 3 dimensions:
  - a. Timeline(s) of what a roadmap, the timeline or a horizontal could look like
  - b. Vertical technical stack to complement the horizontal
  - c. Stakeholder map identifying hot spots, white spaces & initiatives
7. Addendum: examples of models from non-ICT NZ Government departments and functions for reference and input

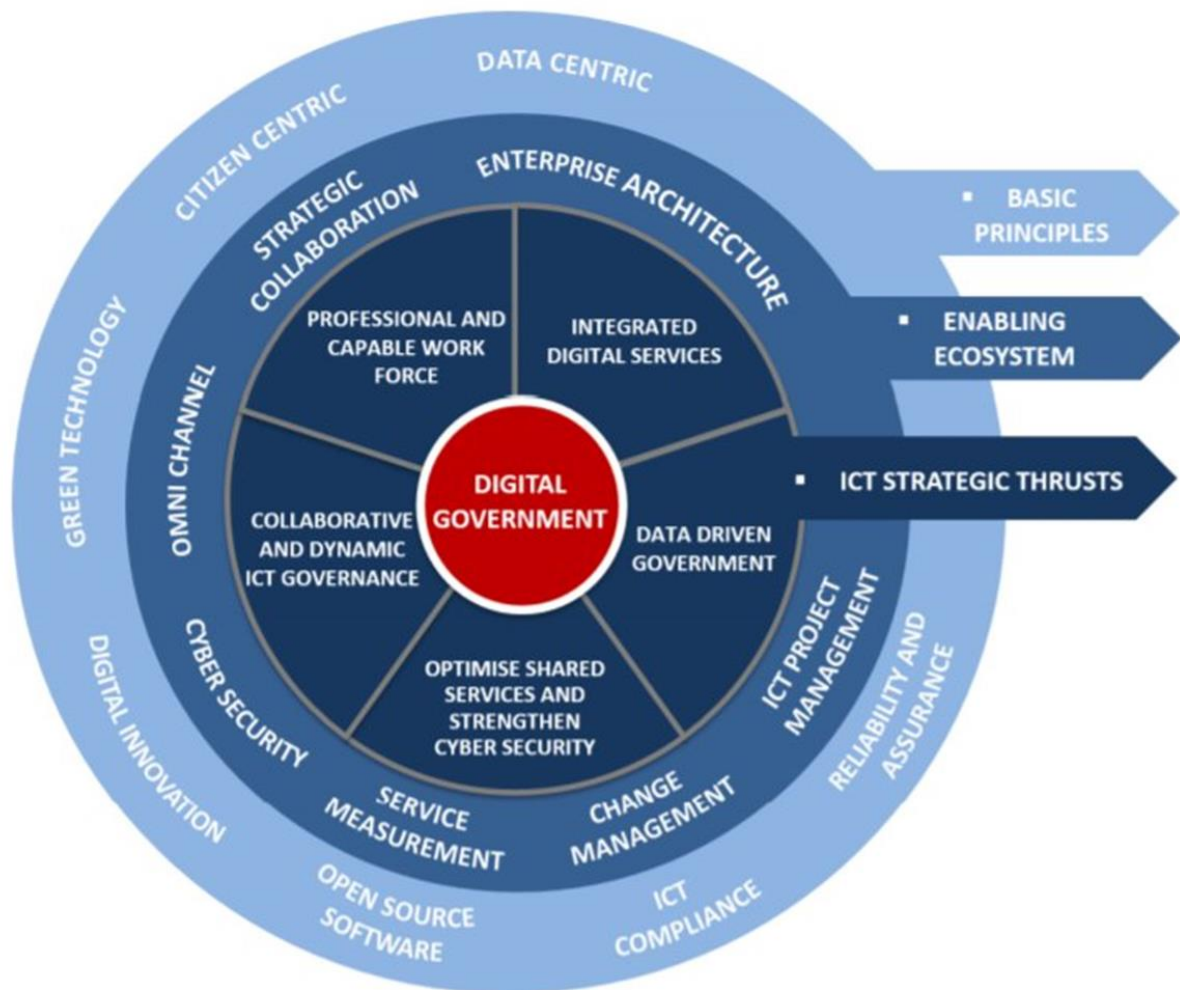
## The Canadian Model

The Government of Canada's Information Technology Strategic Plan sets out the four-year strategic direction for information technology (IT) in the federal government.



<https://www.canada.ca/en/treasury-board-secretariat/services/information-technology/information-technology-strategy/strategic-plan-2016-2020.html>

## The Malaysian Model



Source: MAMPU's The Malaysian Public Sector ICT Strategic Plan 2016 - 2020

[http://www.mampu.gov.my/images/agensikerajaan/perkhidmatan/The-Malaysian-Public-Sector-ICT-Strategic-Plan-2016\\_2020.pdf](http://www.mampu.gov.my/images/agensikerajaan/perkhidmatan/The-Malaysian-Public-Sector-ICT-Strategic-Plan-2016_2020.pdf)

## Singapore's Model to 2015

Intelligent Nation 2015 (iN2015) is Singapore's 10-year masterplan to help us realise the potential of infocomm over the next decade.

Led by the IDA, iN2015 is a multi-agency effort that is the result of private, public and people sector co-creation.

***From the people sector, individuals provided their ideas and views through focus groups and the ExpressIT! iN2015 Competition.***

Recommendation: consider seeking inputs not just from the industry, but also from citizens and in fact all stakeholders to help prioritise and develop strategy; will Singapore's approach of seeking input work in New Zealand?

The competition attracted thousands of entries from students and the general public on how they envisioned infocomm would impact the way they live, work, learn and play in 2015.

In addition, hundreds of private and public sector representatives participated in numerous discussions to come up with ideas for transforming their sectors through infocomm, and how to translate these ideas into reality.

- Digital Media and Entertainment
- Education and Learning
- Financial Services
- Government (iGov2010)
- Healthcare and Biomedical Sciences
- Manufacturing and Logistics
- Tourism, Hospitality and Retail
- Infocomm Infrastructure, Services and Technology Development
- Enterprise Development for Singapore-based Infocomm Companies
- Infocomm Manpower Development

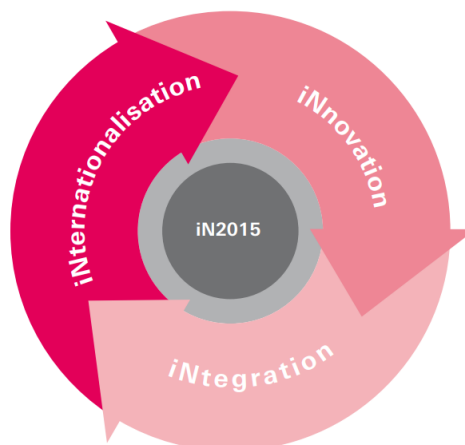


Figure 1-1: Key themes of iN2015

An Intelligent Nation, a Global City, powered by Infocomm.

<http://unpan1.un.org/intradoc/groups/public/documents/unpan/unpan032993.pdf>

## Singapore's Model to 2025

### WHAT WE WANT

We want a nation where people live meaningful and fulfilled lives, enabled by technology, offering exciting opportunities for all.

**Sustainable and  
Quality Growth**

**Better Quality  
of Life**

### WHAT WE NEED

We need to build our sectors to better tap on the potential of infocomm media to tackle our national challenges, and realise our desired outcomes.

#### **A Globally Competitive Infocomm Media Ecosystem that**



**Enables and Complements  
Singapore's Smart Nation Vision**



**Effects Economic and Social  
Transformation**



**Creates Enriching and  
Compelling Content**

### HOW WE WILL GO ABOUT DOING IT

We will focus our efforts to reap the full potential of salient technology and business trends through three strategic thrusts.

**1**



**Capitalise on data, advanced  
communications and  
computational technologies to  
bring about a quantum leap in  
our economic competitiveness**

**2**



**Nurture an infocomm media  
ecosystem that encourages  
risk-taking and continuous  
experimentation to create  
Singapore-made content,  
products and services**

**3**



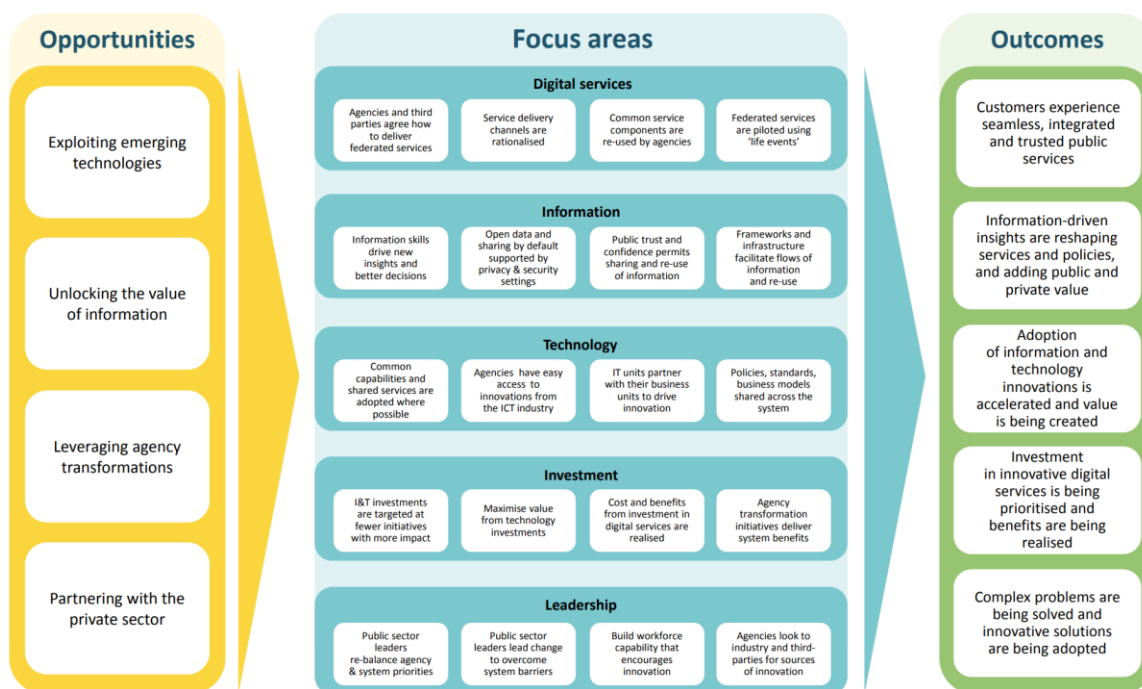
**Connect people through  
infocomm media to enhance  
quality of life in Singapore  
and to foster a stronger  
Singaporean identity**

<https://www.mci.gov.sg/portfolios/infocomm-media/infocomm-media-2025/introduction-to-infocomm-media-2025>



# Government ICT Strategy 2015

Enabling the public sector to exploit ICT-enabled opportunities



New Zealand Government

<https://www.ict.govt.nz/assets/ICT-Strategy/Government-ICT-Strategy-2015-A3.pdf>

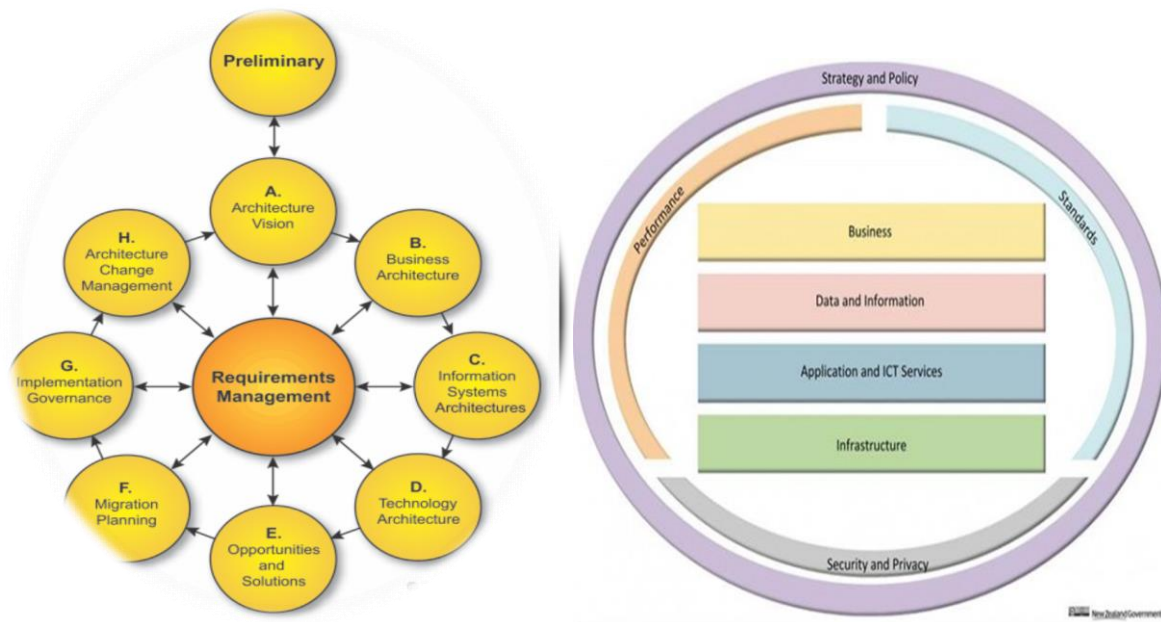
## Architectural Models & Frameworks – The Vertical

Between them, The Open Group's (TOGAF's) Architecture Development Method (ADM) and the Government Enterprise Architecture NZ (GEA-NZ) form the starting point for any ICT development.

Both link the overall vision through to strategy, policy, business, data, applications and infrastructure. In some shape or form, both also include implementation, governance, security & reporting to complete the picture.

They offer guidance and form the Y-Axis or the vertical stack of what our national applications, data & infrastructure could look like.

**Recommendation: Consider using GEA-NZ or TOGAF ADM at a strategic level for the entire government, top-down as a starting point. Spawn more GEA-NZ or ADMs models to support the overall vision and cascade to granularity.**



<https://www.ict.govt.nz/guidance-and-resources/architecture/government-enterprise-architecture-for-new-zealand-framework>

## United Nation's Priorities

For reference and as an example, UN Goals listed below as examples of clearly enunciated and understandable result areas.

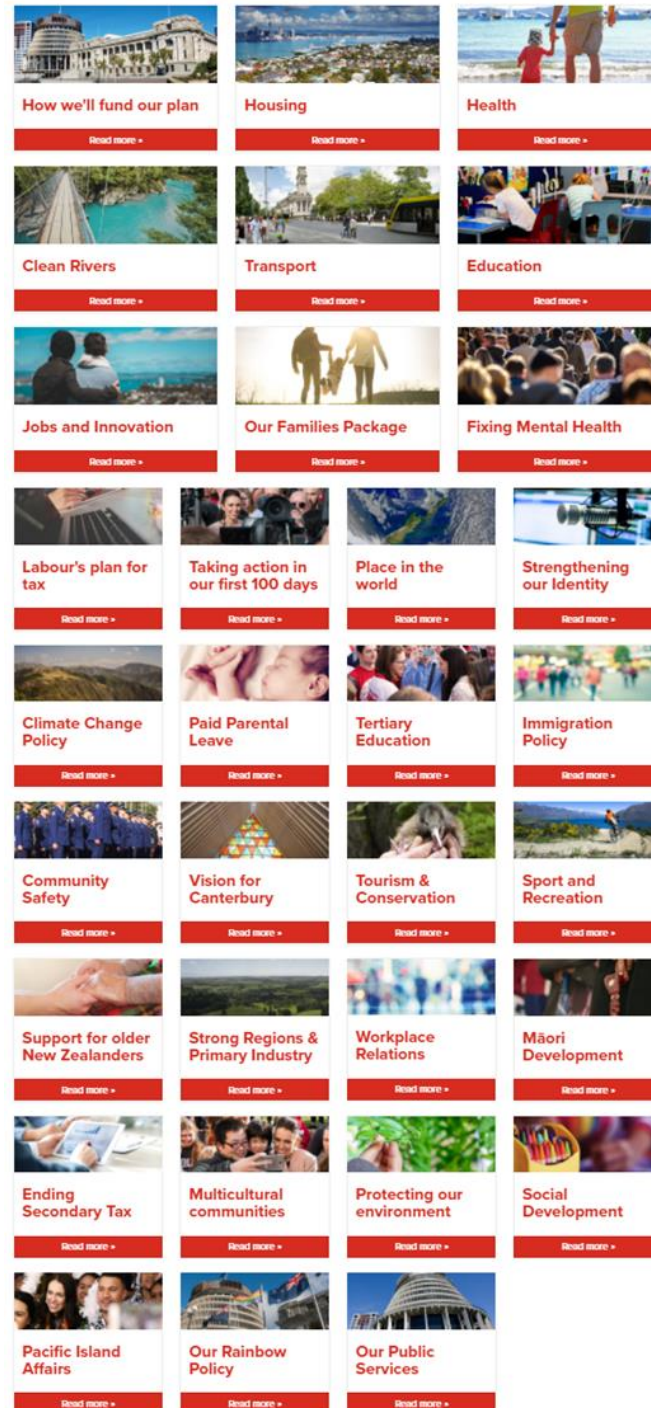


[https://en.wikipedia.org/wiki/Sustainable\\_Development\\_Goals](https://en.wikipedia.org/wiki/Sustainable_Development_Goals)

## New Zealand Government Priorities – What Needs to be Done

These are the Labour Party's manifesto. Programmes of work will be required to deliver the promises.

**Recommendation:** These form the vision for ICT to deliver against



<http://www.labour.org.nz/policy>

**Wouldn't it be great to be able to drill down any one of these key policies to see the ICT strategy, plan, roadmap and programmes of work that are either leading these, or making them happen.**

## Key Players & Stakeholders – The Dots that need to be Joined

### A View of the Total Landscape

My view of all players the total landscape and those who will need to be consulted.

**Recommendation: seek inputs, develop a draft strategy, consult, publish, execute, report – easier said than done**



## NZ Ministerial Portfolios – Dot Cluster 1

### Excludes State Sector Organisations

Included to show size and complexity.

ACC	Agriculture	Arts, Culture and Heritage	Attorney-General
Biosecurity	Broadcasting, Communications and Digital Media	Building and Construction	Child Poverty Reduction
Children	Civil Defence	Climate Change	Commerce and Consumer Affairs
Community and Voluntary Sector	Conservation	Corrections	Courts
Crown/Māori Relations	Customs	Defence	Deputy Leader of the House
Deputy Prime Minister	Disability Issues	Earthquake Commission	Economic Development
Education	Employment	Energy and Resources	Environment
Ethnic Communities	Finance	Fisheries	Food Safety
Foreign Affairs	Forestry	GCSB	Government Digital Services
Greater Christchurch Regeneration	Health	Housing and Urban Development	Immigration
Infrastructure	Internal Affairs	Justice	Land Information
Leader of the House	Local Government	Māori Development	Ministerial Services
National Security and Intelligence	NZSIS	Pacific Peoples	Pike River Re-entry
Police	Prime Minister	Racing	Regional Economic Development
Research, Science and Innovation	Revenue	Rural Communities	Seniors
Small Business	Social Development	Sport and Recreation	State Owned Enterprises
State Services	Statistics	Tourism	Trade and Export Growth
Transport	Treaty of Waitangi Negotiations	Veterans	Whānau Ora
Women	Workplace Relations and Safety	Youth	

[http://www.ssc.govt.nz/state\\_sector\\_organisations](http://www.ssc.govt.nz/state_sector_organisations)

## NZ Government Organisations – Dot Cluster 2

319 organisations in total, impossible to read, but produced below to show size and complexity.

**Question: is there a strategy for shared common infrastructure and for shared, common and open data? If not, is there a case to do some architectural work to investigate and create a roadmap with benefits and cost savings?**

Accident Compensation Corporation	Disputes Tribunal	Intellectual Property Office of New Zealand	Māori Language Commission	Organised & Financial Crime Agency New Zealand	Supreme Court of New Zealand	Wairarapa District Health Board
Accreditation Council	Drug Free Sport New Zealand	International Accreditation New Zealand	Napier City Council	Otago Polytechnic	Tai Poutini Polytechnic	Waikato District Council
Agricultural and Marketing Research and Development Trust	Dunedin City Council	Invercargill City Council	National Advisory Council on the Employment of Women	Otago Regional Council	Tairāwhiti District Health Board	Westferry Services
Air New Zealand	Earthquake Commission	Kaikoura District Council	National Library of New Zealand	Otorohanga District Council	Tairāwhiti Polytechnic	Wellington City Council
Airways Corporation of New Zealand Limited	Eastern Institute of Technology	Kaipara District Council	Nelson City Council	Overseas Investment Office	Takeovers Panel	Wellington Institute of Technology
Alexander Turnbull Library	Education New Zealand	Kapiti Coast District Council	Nelson Marlborough District Health Board	Pacific Co-operation Foundation	Taranaki District Health Board	Wellington Regional Council
Animal Control Products Limited	Education Review Office	Kawerau District Council	Nelson Marlborough Institute of Technology	Pacific Island Business Development Trust	Taranaki Regional Council	West Coast District Health Board
Ara Institute of Canterbury	Electoral Commission	Kiwitahi Holdings Limited	New Plymouth District Council	Palmerston North City Council	Taranaki District Council	West Coast Regional Council
Arts Council of New Zealand Te Ataarua	Electrical Workers Registration Board	Kordia Group Limited	New Zealand Aid Programme	Parliamentary Counsel Office	Tasman District Council	Western Bay of Plenty District Council
Ashburton District Council	Electricity Authority	Lakes District Health Board	New Zealand Antarctic Institute	Parliamentary Service	Taupo District Council	Western Institute of Technology at Taranaki
Asia New Zealand Foundation	Employment Relations Authority	Land Information New Zealand	New Zealand Army	Personal Property Securities Register	Tauranga City Council	Westland District Council
AsureQuality Limited	Energy Efficiency and Conservation Authority	Landcorp Farming Limited	New Zealand Artificial Limb Service	Pharmaceutical Management Agency	Te Aho Whakapaki Wirangi (Māori Broadcasting Funding Agency)	Whakatane District Council
Auckland Council	Energy Safety	Law Commission	New Zealand Blood Service	Pōhiva City Council	Te Tumu Paesaa	Whanganui District Council
Auckland District Health Board	Environment Court	Leadership Development Centre	New Zealand Customs Service	Privacy Commissioner	Te Whare Wānanga o Awanuiāraangi	Whanganui District Health Board
Auckland University of Technology	Environmental Protection Authority	Legal Aid Tribunal	New Zealand Debt Management Office	Public Trust	Te Wānanga o Aotearoa	Whangarei District Council
Audit New Zealand	External Reporting Board	Lincoln University	New Zealand Defence Force	Queenstown-Lakes District Council	Te Wānanga o Raukawa	Whitireia Community Polytechnic
Aviation Security Service	Fairway Resolution Limited	Mackenzie District Council	New Zealand Export Credit Office	Quotable Value Limited	TeachNZ	Work and Income
Bay of Plenty District Health Board	Far North District Council	Manawatu District Council	New Zealand Film Commission	Radio Spectrum Management	Telarc Limited	WorkSafe New Zealand
Bay of Plenty Regional Council	Financial Markets Authority	Manawatu-Wanganui Regional Council	New Zealand Fish and Game Council	Rangitikei District Council	Telford Rural Polytechnic	Youth Court
Broadcasting Commission	Fire and Emergency New Zealand	Manukau Institute of Technology	New Zealand Game Bird Habitat Trust Board	Real Estate Agents Authority	Tenancy Services	
Broadcasting Standards Authority	Fire and Emergency New Zealand Board	Maritime New Zealand	New Zealand Geographic Board	Register of Unions	Tertiary Education Commission	
Building System Performance	Genesis Energy Limited	Marlborough District Council	New Zealand Lotteries Commission	Research and Education Advanced Network New Zealand Limited	Thames-Coromandel District Council	
Buller District Council	Gisborne District Council	Massey University	New Zealand Lottery Grants Board	Reserve Bank of New Zealand	The Office of Ethnic Communities	
Callaghan Innovation	Gore District Council	Masterston District Council	New Zealand Petroleum & Minerals	Resolution Services	The Treasury	
Canterbury District Health Board	Government Communications Security Bureau	Matamata-Piako District Council	New Zealand Police	Rotorua District Council	Timaru District Council	
Canterbury Regional Council	Government Superannuation Fund Authority	MedSafe	New Zealand Post Limited	Royal New Zealand Airforce	Toi Ohomai Institute of Technology	
Capital & Coast District Health Board	Grey District Council	Meridian Energy Limited	New Zealand Productivity Commission	Royal New Zealand Navy	Trading Standards	
Careers New Zealand	Guardians of New Zealand Superannuation	Meteorological Service of New Zealand Limited	New Zealand Qualifications Authority	Ruapehu District Council	Transport Accident Investigation Commission	
Carterton District Council	Hamilton City Council	MidCentral District Health Board	New Zealand Quality College	Selwyn District Council	Transpower New Zealand Limited	
Central Hawke's Bay District Council	Hastings District Council	Ministry for Culture and Heritage	New Zealand Security Intelligence Service	Senior Services	Unitec Institute of Technology	
Central Otago District Council	Hauraki District Council	Ministry for Pacific Peoples	New Zealand Symphony Orchestra	Serious Fraud Office	University College of Learning	
Charities Services	Hawke's Bay District Health Board	Ministry for Primary Industries	New Zealand Tourism Board	Social Policy Evaluation and Research Unit - Superu	University of Auckland	
Chatham Islands Council	Hawke's Bay Regional Council	Ministry for Vulnerable Children, Oranga Tamariki	New Zealand Trade and Enterprise	Social Workers Registration Board	University of Canterbury	
Children's Commissioner	Health Promotion Agency	Ministry for Women	New Zealand Transport Agency	Solid Energy New Zealand Limited	University of Otago	
Christchurch City Council	Health Quality and Safety Commission New Zealand	Ministry for the Environment	New Zealand Walking Access Commission	South Canterbury District Health Board	University of Waikato	
Civil Aviation Authority of New Zealand	Health Research Council of New Zealand	Ministry of Business, Innovation and Employment	Ngāi Tahu Ancillary Claims Trust	South Taranaki District Council	Upper Hutt City Council	
Clutha District Council	Health and Disability Commissioner	Ministry of Civil Defence and Emergency Management	NorthTec	South Waikato District Council	Valuers Registration Board	
Commerce Commission	Heartland Services	Ministry of Consumer Affairs	Northland District Health Board	South Wairarapa District Council	Veterans Affairs New Zealand	
Commission for Financial Capability	Heritage New Zealand	Ministry of Defence	Northland Regional Council	Southern District Health Board	Victoria University of Wellington	
Companies Office	Honwhenua District Council	Ministry of Education	Office for Disability Issues	Southern Institute of Technology	Waikato District Council	
Controller and Auditor-General	Housing New Zealand Corporation	Ministry of Foreign Affairs and Trade	Office for Seniors	Southern Response Earthquake Services Limited	Waikato District Health Board	
Courtesy Manukau District Health Board	Human Rights Commission	Ministry of Health	Office of Film and Literature Classification	Southland District Council	Waikato Institute of Technology	
Court of Appeal	Hurunui District Council	Ministry of Justice	Office of Human Rights Proceedings	Southland Regional Council	Waikato Regional Council	
Crown Fibre Holdings Limited	Hutt City Council	Ministry of Māori Development	Office of Treaty Settlements	Sport New Zealand	Waimakariri District Council	
Crown Law Office	Hutt Valley District Health Board	Ministry of Social Development	Office of the Auditor-General	Standards New Zealand	Waimate District Council	
Defence Employer Support Council	Immigration New Zealand	Ministry of Transport	Office of the Clerk of the House of Representatives	State Housing Appeals Authority	Waipa District Council	
Department of Conservation	Immigration and Protection Tribunal	Ministry of Youth Development	Office of the Ombudsman	State Services Commission	Wairarapa District Health Board	
Department of Corrections	Independent Police Conduct Authority	Motor Vehicle Traders Register	Office of the Parliamentary Commissioner for the Environment	Statistics New Zealand	Waikato District Council	
Department of Internal Affairs	Inland Revenue Department	Museum of New Zealand Te Papa Tongarewa	Open Polytechnic of New Zealand	Stratford District Council	Waikato District Council	
Department of the Prime Minister and Cabinet	Insolvency and Trustee Service	Māori Land Court	Optic District Council	StuDiYnk	Waitangi Tribunal	

<https://www.govt.nz/organisations/>



## The Larger Wellington Eco-System – Dot Cluster 3

Borrowed from AccessGranted's WellyTech2017 Christmas Party – this is an indication of the larger Wellington eco-system. No doubt this is replicated in all other cities and regions.

This sector comprising specialist groups and often at the cutting edge has a lot to contribute by way of innovation and social enterprise. They could do with much better connections with both government and the larger players in the industry in general.

**Recommendation: Join the Dots by way of regular communications, updates, and meetings so that connections are made, efforts are synchronised and duplication is eliminated.**



<https://www.accessgranted.nz/jibberjabber/2017/10/4/wellytech-2017-christmas-party-this-year-its-big>

### The Wellington StartUp Eco-System

- CreativeHQ
- Victoria Entrepreneur Bootcamp
- VentureUp
- Lightning Lab
- R9 Accelerator
- WREDA
- AngelHQ
- Callaghan Innovation
- Enspiral
- Akina Foundation

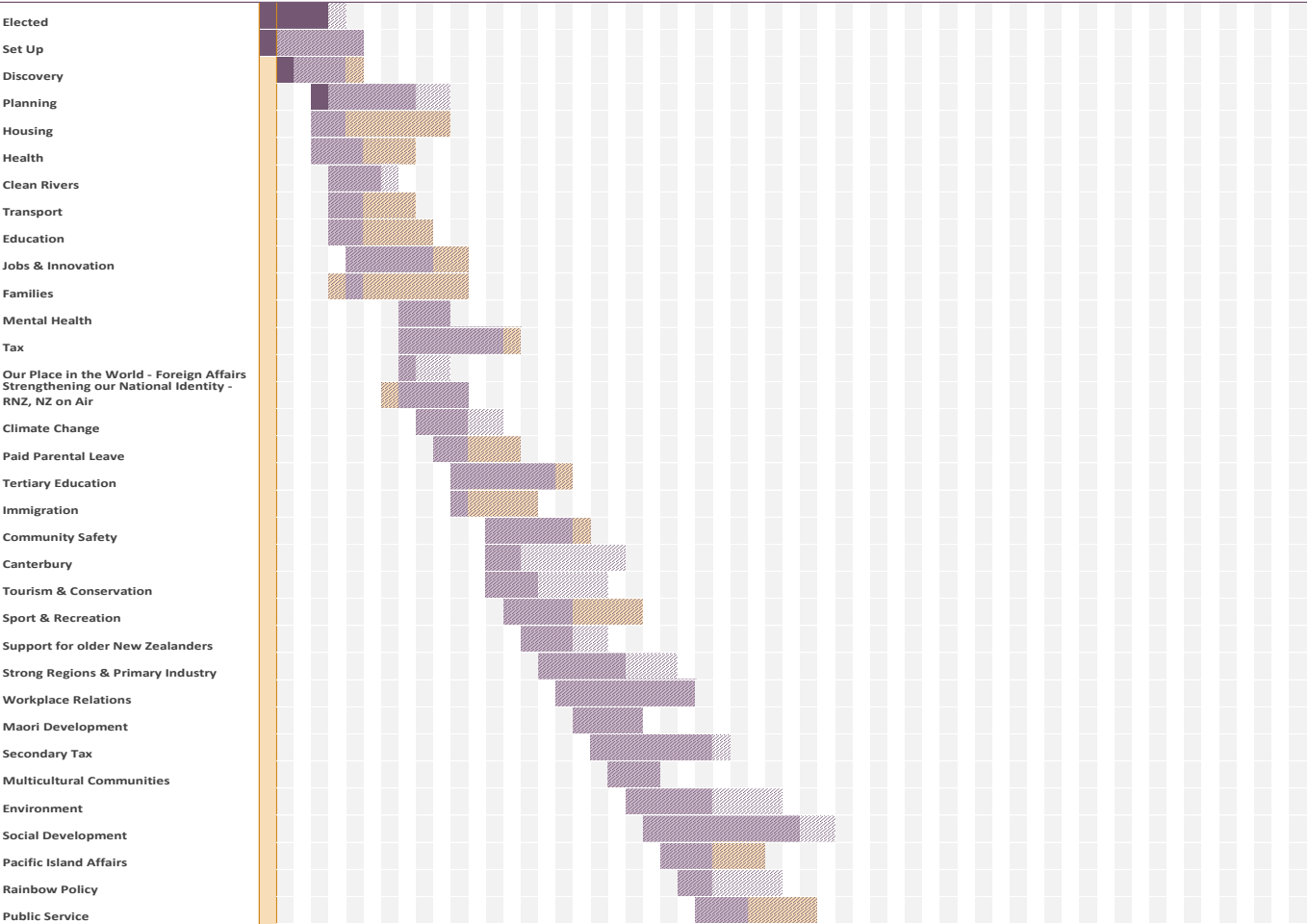
<https://www.wellingtonnz.com/business/startups/>



# Initiatives, Programs, Projects & Timelines – The Horizontal

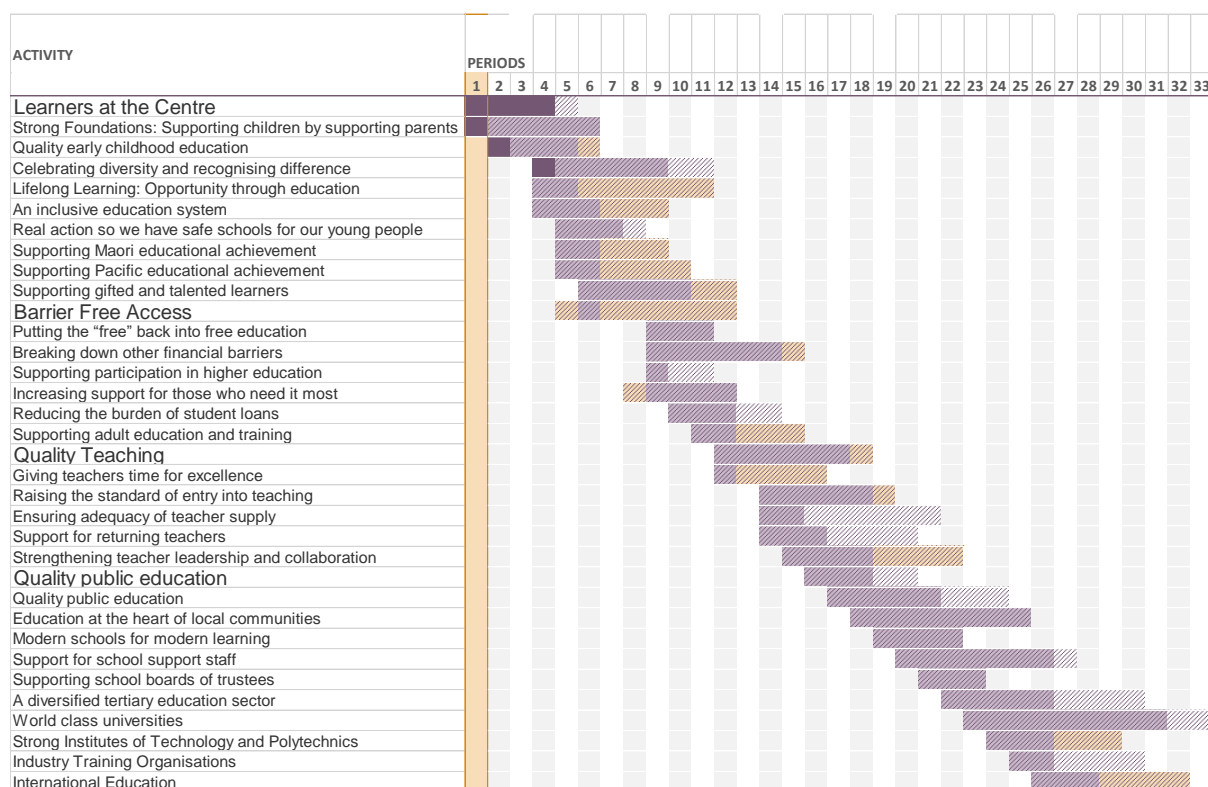
## National Level Program View

Pulling in the Labour Government policy initiatives into a simple indicative linear project plan to create a high level national level view.



## Example - Education Related Projects & Initiatives

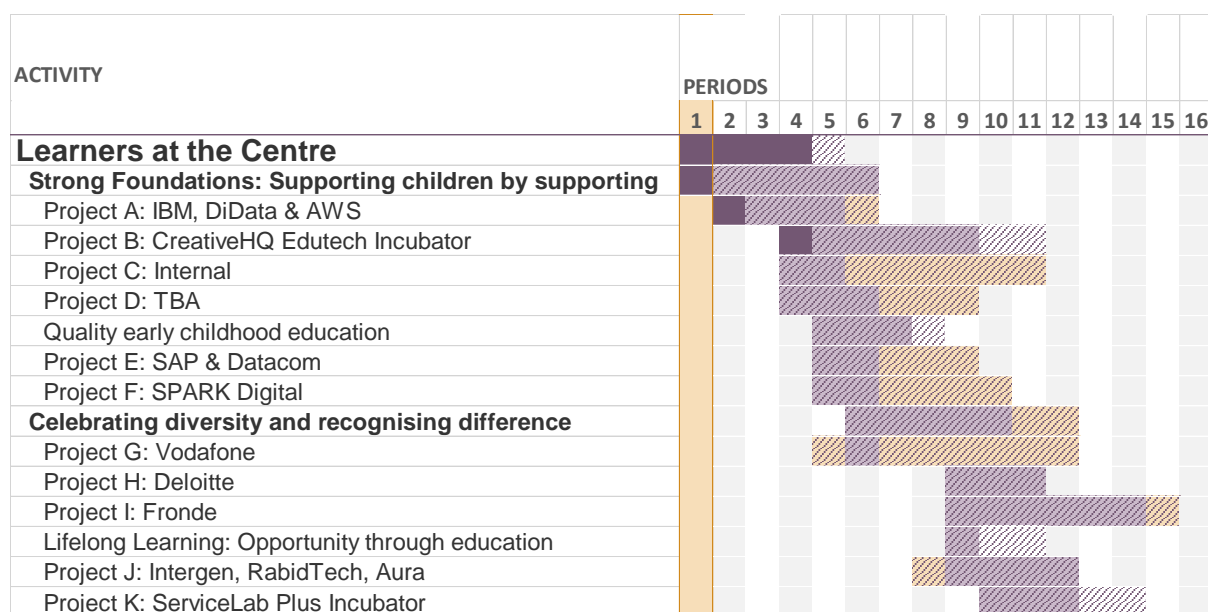
Details of what the Education Program could look like. Based on Labour Party's Education Manifesto.



<http://www.labour.org.nz/educationmanifesto>

## Example Timeline – Learners at the Centre initiative

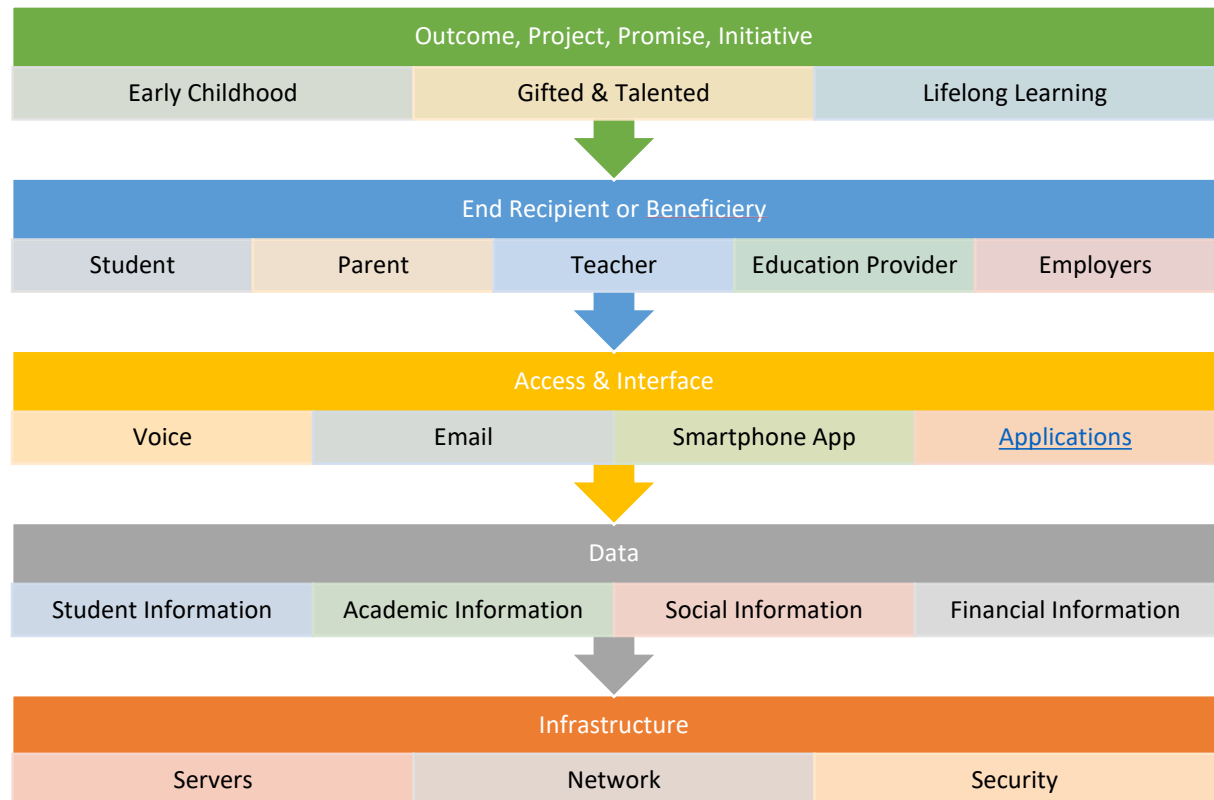
A mock up example of the projects under a program and **all** players working to support the overall vision. Includes large industry multinationals, large local players, New Zealand owned business, and incubators.



## Education – Example of the Vertical

Starting at the top with the policy initiative or the outcome, project, promise or initiative, drilling down to the persona or the positively impacted person, community or education service provider, through to application or channel, down to data, and finally to the infrastructure.

Not depicted here but contained in the GEA-NZ, this assumes security, access, metrics, reporting, governance etc.



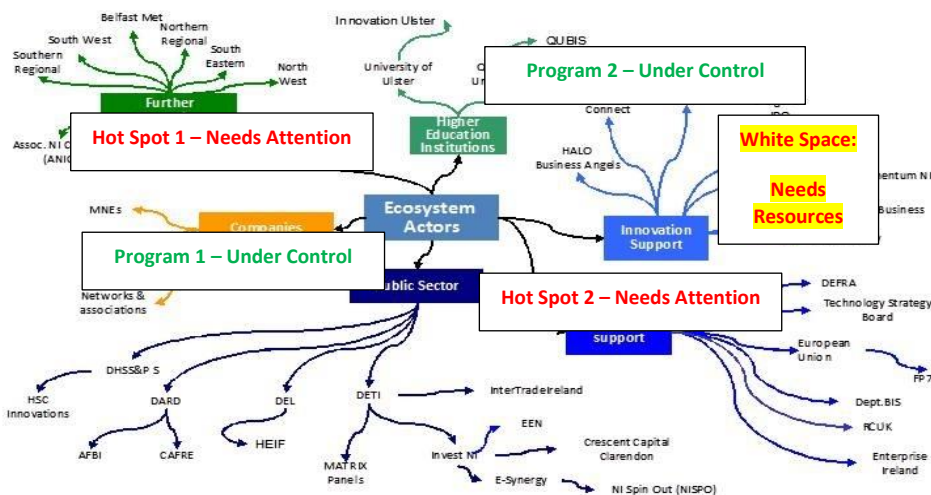
## Bringing it Together

### Hotspots, White Spaces & Opportunities – Visual Representation of an Ecosystem

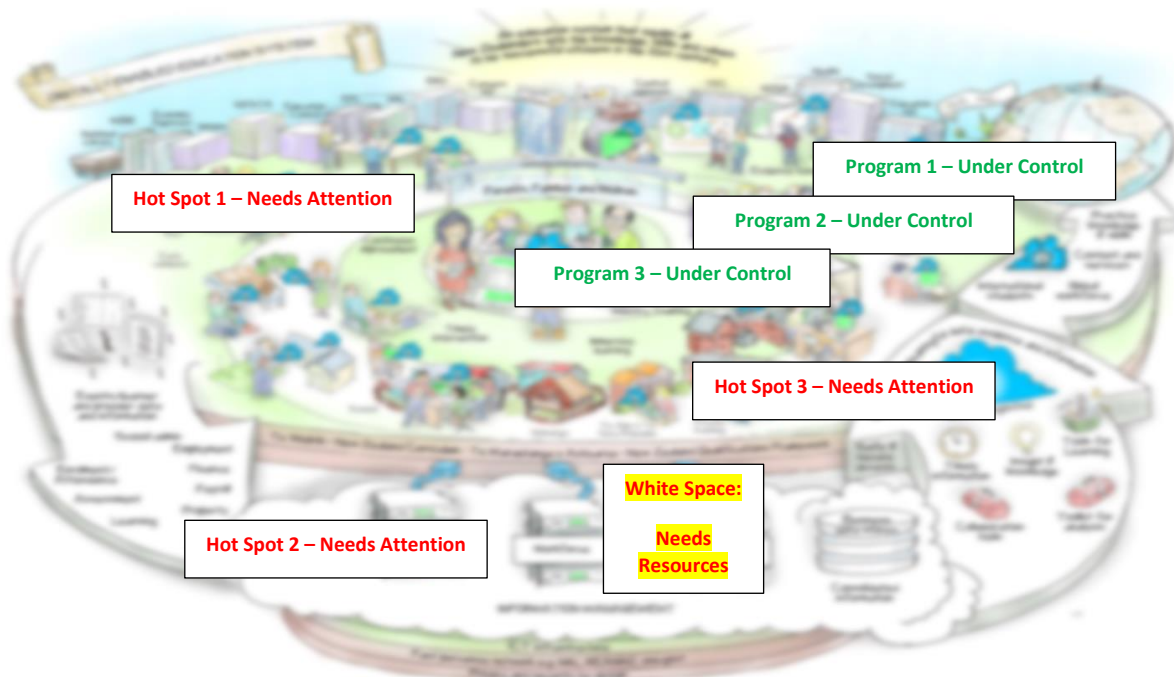
Having the list of priorities, the programmes of work that are under way to support them, and all the players involved – a graphical representation of who is doing what where could look like these two examples below.

This should help identify hotspots and white spaces. And with that help allocate or assign corporate, government or entrepreneurial resources where they can make maximum impact.

Example 1:



Example 2 (blurred on purpose):



## Summary

1. ICT Vision - as a nation, New Zealand does not have a visionary, coherent, long term, visible, contemporary, ICT strategy
2. Framework & Principles - related to the above, national overarching architectural principles & framework covering data, applications & infrastructure do not appear to be in place
3. Silos & Lack of Cohesion – while there is good work being done, they appear to be in disjointed silos, in isolation and there is no clear visibility of the total landscape perhaps leading to duplication of effort in some areas while other areas are left potentially under-served
4. Visibility - while there is visibility of large government ICT projects, the total holistic picture including smaller projects, private sector initiatives, start-ups and any social enterprise is not in place

## Suggested Path Forward

1. Creation of a New Zealand ICT Strategy & Roadmap supporting the overall vision of the government; the roadmap being the horizontal timeline
2. Prioritisation of what needs to be done, in which area, by whom, for whom, for what benefit
3. Publication of National Architectural Foundations & Principles covering data, applications, & infrastructure – as well as security, access and interoperability; forming the basis for the vertical stack
4. Identification of all stakeholders and consulting and actively engaging with them with a view of seeking inputs, making meaning connections and collaboration, so that appropriate resources can be applied to solve social issues in the most effective manner
5. A real time graphical map showing who is doing what, where, to achieve what outcome, complete with details of the time horizon and the vertical stack; ability to see hotspots and white spaces to identify areas of opportunities
6. Covering the full spectrum from large government projects down to incubators and innovation labs if they are funded by the government

## Benefits

1. Coherence, strategy, roadmap, priorities
2. Open, published architectural framework & rules
3. Identification of areas of immediate impact, business & social opportunities
4. Ability to steer private and entrepreneurial resources to areas needing attention
5. Better market information for a more competitive landscape
6. All in all, harnessing and aligning all the resources in a deliberate and constructive manner to accelerate the benefits to New Zealand as a whole

## Addendums

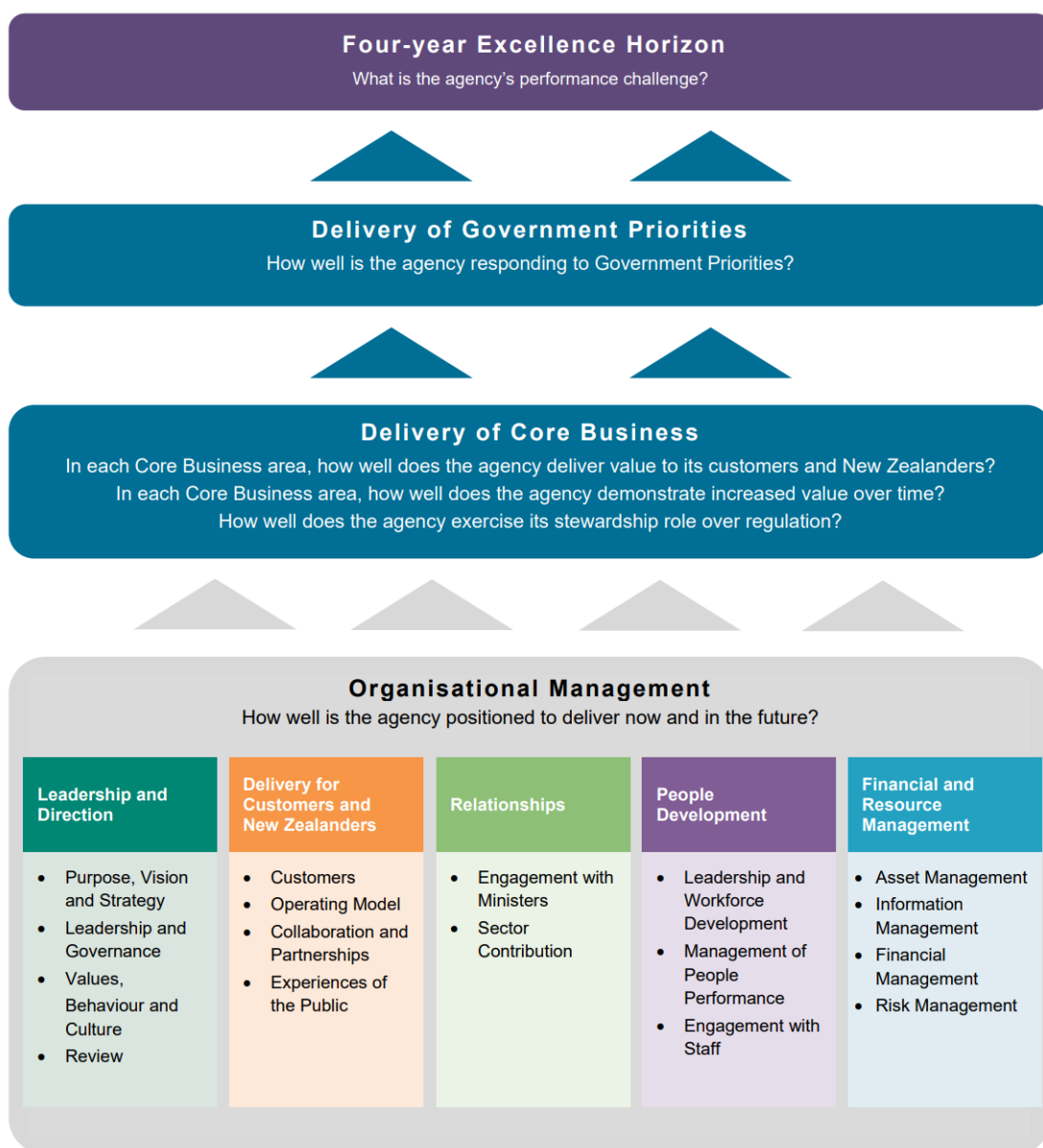
### NZ Examples outside ICT - Performance Improvement Framework; State Services Commission

The Performance Improvement Framework (PIF) helps senior leaders in the State Services lead performance improvement in their agencies and across the system.

Users of the framework start with the question: “what is the contribution New Zealand needs from this agency (or sector or system) in the medium term?”

They then use the framework to identify the critical gaps and opportunities between the current and desirable future capability and performance.

This is the performance challenge, and it is described in the Four-year Excellence Horizon.



[http://www.ssc.govt.nz/sites/all/files/pif-core-guide-1-dec2015\\_0.pdf](http://www.ssc.govt.nz/sites/all/files/pif-core-guide-1-dec2015_0.pdf)



## NZ Examples outside ICT - NZ Higher Living Standards; Treasury

Our vision is focused on higher living standards for New Zealanders.

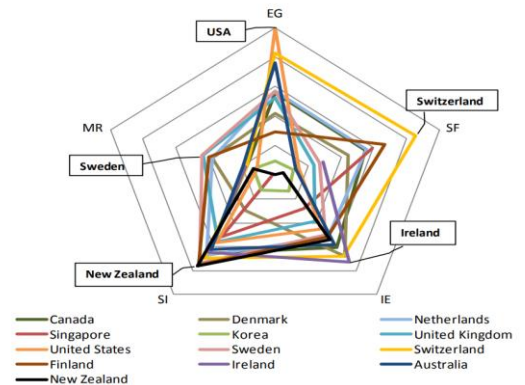
Achieving this requires growing the country's human, social, natural, and financial/physical capitals which together represent New Zealand's economic capital.

<http://www.treasury.govt.nz/abouttreasury/higherlivingstandards>

### Applying the Living Standards Framework to the Investment Approach



### New Zealand compared to other countries



## The Four Capitals

Intergenerational wellbeing relies on the growth, distribution, and sustainability of the Four Capitals. The Capitals are interdependent and work together to support wellbeing.



### Natural Capital

This refers to all aspects of the natural environment needed to support life and human activity. It includes land, soil, water, plants and animals, as well as minerals and energy resources.



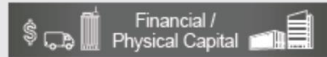
### Social Capital

This describes the norms and values that underpin society. It includes things like trust, the rule of law, the Crown-Māori relationship, cultural identity, and the connections between people and communities.



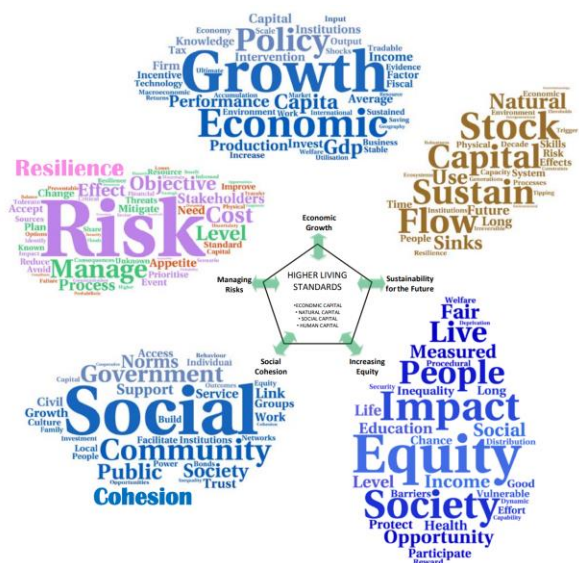
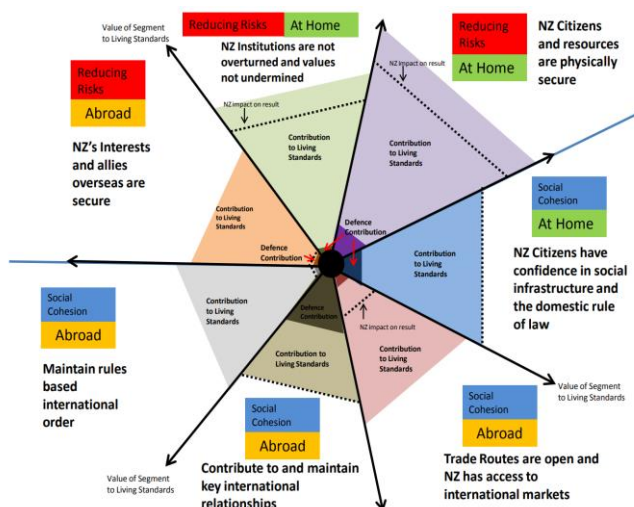
### Human Capital

This encompasses people's skills, knowledge and physical and mental health. These are the things which enable people to participate fully in work, study, recreation and in society more broadly.



### Financial / Physical Capital

This includes things like houses, roads, buildings, hospitals, factories, equipment and investments. These are the things which make up the country's physical and financial assets which have a direct role in supporting incomes and material living conditions.



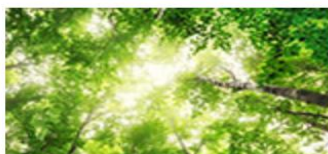


## Accelerating Innovation

A strong, joint research institute for Sweden. Innventia, SP and Swedish ICT have joined RISE to become a stronger research and innovation partner.

In international collaboration, with academia, business and public sector, we contribute to a competitive business community and a sustainable society.

<https://www.sp.se/en/Sidor/default.aspx>



### RISE Bioeconomy

RISE Bioeconomy is world-leading and we work with innovations based on forest raw materials. The majority of our operations are carried out in project form via research programmes involving many partners, or in development projects with individual customer companies.

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### RISE ICT

RISE ICT is in the most expansive area of industry this century: the total digitalization of products, services and businesses. We are in the midst of this revolution, boosting the competitive strength of Swedish industry and the quality and efficiency of Sweden's public sector. We contribute with cutting edge technology within many areas.

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### RISE Bioscience and Materials

We are the natural innovationpartner for customers within the agricultural, chemistry, food, medical technology, Health innovation and biochemicals area. Our 370 co-workers can offer you services within research & development, testing & analysis, education and verification.

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### RISE Safety and Transport

We have cutting-edge expertise within everything from mechanical risks to measurement technology and fire protection. We work with testing, inspection, calibration and certification. We have world-class laboratories for fire, high-voltage and AstaZero, a full-scale test environment for future road safety.

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### RISE Built Environment

We work with built environment, optimization of resources, construction, infra-structure solutions and city development. We offer R&D-services that creates benefits for business and society and have a focus on human interest. We are approx. 350 co-workers.

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### RISE Certification

RISE Certification is one of the leading bodies in the field of certification in Sweden, with long experience of the work. We issue certificates of compliance with a large number of standards. We are a partner upon whom you can totally rely. We are approx 70 co-workers.

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