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<td>A. 4 September 2018, Planning Committee: Public Input - Auckland Marina Users Association Inc - Strategic approach to marinas, Presentation</td>
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12 Update on the Auckland Unitary Plan Monitoring Project

A. 4 September 2018, Planning Committee: Item 12 - Update on the Auckland Unitary Plan Monitoring Project, Presentation
HURRICANE NO NAME

THE STORM THAT CHANGED EVERYTHING

AT 213 KM/H
WE LOST 40% OF THE NETWORK OVER A 15 MIN WINDOW

Please note the correlation between the peak wind gusts and the Network tripping.
Attachment A

5.1
Attachment A

AUCKLAND WIDE DAMAGE
DAMAGE TO PRIVATE HOMES AND SERVICE LINES

“The Insurance Council of New Zealand said the storm resulted in more than 13,000 insurance claims costing more than $72 million.

The storm on April 10 and 11 was the most expensive this year and the fifth most expensive this century.”
VECTOR'S NETWORK IS MORE UNDERGROUND THAN ITS PEERS

- Vector’s network is 55% underground. The average percentage of undergrounding across NZ EDBs is 27%.
- Figure A gives a comparison of where Vector sits compared to all 29 EDBs in New Zealand, based on the number of ICP/km²; while Figure B shows the % underground in AU.
- Another example is Japan. Its electricity system is dominated by overhead lines. In Tokyo, only 7% of the electricity lines are underground and for Japan as a whole, only 1% are underground (Ref. 13).

Figure A: Percentage undergrounding in NZ

Figure B: Percentage undergrounding in AU

<table>
<thead>
<tr>
<th>State</th>
<th>City</th>
<th>Underground</th>
</tr>
</thead>
<tbody>
<tr>
<td>Victoria</td>
<td>Citipower (Melbourne city)</td>
<td>40%</td>
</tr>
<tr>
<td></td>
<td>Jemena (North West metropolitan)</td>
<td>30%</td>
</tr>
<tr>
<td></td>
<td>Melbourne</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SP Ausnet (rural Victoria – rest of state not covered by Powercor)</td>
<td>14%</td>
</tr>
<tr>
<td>Queensland</td>
<td>Ergon Energy</td>
<td>6%</td>
</tr>
<tr>
<td></td>
<td>Essential Energy (rural NSW)</td>
<td>5%</td>
</tr>
<tr>
<td>NSW</td>
<td>Ausgrid (Sydney, Central Coast and Hunter Valley)</td>
<td>35%</td>
</tr>
<tr>
<td>Tasmania</td>
<td>TasNetworks (One DNSP for State)</td>
<td>11%</td>
</tr>
<tr>
<td>South Australia</td>
<td>SA Power Networks (one DNSP for State)</td>
<td>10%</td>
</tr>
<tr>
<td></td>
<td>ACT EvoEnergy (One DNSP for region)</td>
<td>5%</td>
</tr>
</tbody>
</table>

13. https://www.japantimes.co.jp/community/2017/03/04/how-to-ass-every-see-no-obstacles-way/#T5Wt65mwaY#poo
ESTIMATED COST TO UNDERGROUND THE VECTOR NETWORK

Cost for urban Auckland

$3.6B

Cost for rural Auckland

$1.9B

or

Additional $870 lines charges pa (i.e. more than doubles) for the average customer compared to 700$/year today. Assuming the regulator will allow the expenditure given the significant impact associated with the economic write-down of the existing overhead assets.

or

Additional $460 lines charges pa for the average customer compared to 700$/year today. Assuming the regulator will allow the expenditure given the significant impact associated with the economic write-down of the existing overhead assets.

These estimates excludes the significant additional costs other infrastructure providers such as Auckland Council, Auckland Transport and Chorus will incur to relocate, reconnect and reinstatement their services.

All costs based on figures from Vector database
Attachment B

Item 5.1

SETTING THE SCENE:
INCREASING THREATS TO ELECTRICITY RESILIENCE ACROSS THE SUPPLY CHAIN
KEEPPING THE LIGHTS ON AMID INCREASING COMPLEXITY

- Electricity consumption is changing rapidly as consumers electrify their lives, increasing expectations on the reliability of the energy system. Consumer dependency on electricity will continue to rise with the advent of new tech solutions and the uptake of electric vehicles.
- In parallel with the rising importance of the electricity system, the impacts of environmental factors, such as climate change, are increasingly being felt in New Zealand and across the world. With climate change increasing the likelihood of adverse weather events, it is clear that the number and duration of electricity outages will rise.
- This paper discusses the resilience of the electricity system from an electricity distribution business (EDB) perspective. Other parts of the electricity system, while not specifically discussed, play a critical role in energy resilience, therefore the resilience of the whole system is important.
- As increased electricity system resilience comes at a cost ultimately borne by consumers, Vector believes that the various options, trade-offs, and costs should be transparent; especially as new technology creates greater choice for household-based resilience options. These options, such as household battery and solar installations, and vehicle to grid electric vehicle chargers, have additional benefits over and above increased customer resilience, for example offsetting energy costs and providing carbon benefits.
- While the Vector network currently provides, on average, 99.7% reliability, with the increasing criticality of electricity, consumers may no longer find this sufficient. To increase the resilience of the network however, Vector does not want to burden future generations with costly solutions that have long-term regulated cost-recovery periods, may only benefit a limited number of consumers, and that cannot ensure the lights will stay on, for example where there are resilience threats to generation and transmission due to drought or equipment failure, which will have a flow-on impact to the distribution network regardless of newly implemented network-focused resilience measures.
- With the emergence of new technology, there are increasing resilience options for consumers, outside of network scale measures. These consumer-focused solutions provide households and businesses with greater control, have shorter financial returns that do not burden future generations, guarantee consumers directly benefit from resilience investments, and as mentioned, provide further benefits such as offsetting energy costs.
- This paper aims to create transparency, to support consumers to understand the options available to them and the trade-offs required to take control of their energy resilience. While previously only network, transmission or generation-based solutions were available to increase resilience, the emergence of new technology, and the rapidly declining cost curve for these technologies, is creating new opportunities for customer controlled resilience options.
RESILIENCE MUST BE SYSTEM-WIDE

THE ELECTRICITY SUPPLY CHAIN IN NEW ZEALAND.

GRID CONNECTED GENERATION

NETWORK DISTRIBUTION LINES

YOUR HOME OR BUSINESS

HIGH-COUNTRY, NZ

THE CUMBERLAND DAM, NEW ZEALAND.
THREATS TO RESILIENCE IMPACT EACH SEGMENT OF THE ELECTRICITY SUPPLY CHAIN DIFFERENTLY

The electricity supply chain is an interdependent system that includes large-scale generation, transmission lines, distribution networks and customers. The resilience of supply must therefore be understood from a system-wide perspective.

There are a wide range of factors which can affect the resilience of electricity at each stage of the supply chain. Some of these threats are unique to generation, transmission or distribution, while others are common across the supply chain, however the magnitude of the impact may differ. This diagram illustrates which resilience threats are common to all elements of the supply chain, and highlights some of the unique threats, such as vegetation and vehicles, at each level of the supply chain.

On any given day, there are likely to be multiple threats to resilience, for example, a combination of drought and high temperatures. These threats can heighten resilience risks, create short-term localised damage, or create wide spread and long-term challenges to electricity supply.

The New Zealand electricity system is particularly vulnerable to environmental impacts with 80% of our electricity coming from climate-dependent wind and hydro generation. New Zealand’s remote location in the South Pacific also makes it prone to natural disasters. Auckland is at risk from a wide range of natural disasters due to its location on a narrow coastal land mass on top of a volcanic field. Environmental factors, including climate change, in combination with natural hazards will impact each part of the electricity system differently, but ultimately affect customers directly.
THE FACTS AND FIGURES:

UNDERSTANDING THE IMPACTS OF EMERGING ENVIRONMENTAL FACTORS SUCH AS CLIMATE CHANGE
EXAMPLES OF KEY ENVIRONMENTAL RISKS - NEW ZEALAND

RECENT EARTHQUAKE DISASTERS INCLUDE:
• 2010/11 earthquakes in Christchurch;
• 2016 Kaikoura earthquake.

RECENT STORMS AND FLOODS INCLUDE:
• Lower North Island 2004 floods;
• Winter Weather Bomb 2008;
• Ex-Tropical cyclone Wilma 2011;
• Cyclone Gita 2018;
• Auckland Storm 2018.

RECENT DROUGHTS INCLUDE:
• In 2008, following two years of dry weather, New Zealanders were asked to cut electricity consumption by 15% or face rolling power cuts.

http://www.gns.cri.nz
KEY CLIMATE CHANGE RISKS TO VECTOR’S NETWORK

- Vector has undertaken an assessment of the risk of different climate parameters to the Auckland electricity and gas network - The Physical Effects of Climate Change report, completed by EY in November 2017 (Ref. 1).
- An analysis of Vector’s outage data revealed climate variables, particularly wind, with historically high impacts.

The graph below shows that as sustained wind speeds on the Vector network exceeded 70km/h there is a significant increase in the duration of outages (blue line), customer minutes lost (grey line) and number of customers affected (orange line).

- The EY model projects that the number of hours with wind in the 70-80km/h range will increase significantly.
- Taking the 95th percentile output (1 in 4 chance) the projected increase in customer minutes lost is expected to increase by 200% by 2030 and almost 400% by 2050.
- The impacts of climate change are felt across the electricity supply chain, as illustrated below.

Average outage duration, customers impacted and total customers lost based on wind speed (2004-16)

Key climate change risks on whole electricity system

<table>
<thead>
<tr>
<th>Potential climate impacts per asset class</th>
<th>Year 2025</th>
<th>Year 2030</th>
<th>Year 2050</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air temperature</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Water temperature</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Water availability</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rain</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wind speed</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Snow</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sea level</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Floods</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Heatwaves</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Drought</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Snowstorms</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Heatwaves on equipment</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 1: Potential climate impacts per asset class
Customer Choice:
Both Customer and Network-Focused Solutions for Increased Resilience
A SHARED APPROACH TO RESILIENCE

Undergrounding is an example of the challenges
electricity utilities face in improving resilience. EDBs cannot
underwrite the financial burden that this would be for our
customers. In addition, an overhead of 40 years, if an EDB has
an estimated $3.5 billion to underground the
remaining 45% of Vector's overhead network.

As environmental factors and changing
customer demands increase the threats posed
to our electricity supply, it is essential that we
consider a different approach to resilience.

An undergrounding solution, which is a two stage
to reduce the risk of future adverse events.

Avert falling costs and improve resilience.

- Establishing reliable, diverse, and
dependable generation options.
- Managing the configuration of the network.
- Changing the configuration of the network.
- Opting for a number of options that
provide for a robust network.
- Reducing the costs and improving
resilience.
## INVESTMENT OPTIONS FOR AN EDB TO IMPROVE RESILIENCE

<table>
<thead>
<tr>
<th>OPTION</th>
<th>DESCRIPTION</th>
<th>COMMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Microgrids</td>
<td>Distributed generation combined with new storage options to island electricity supply to a small group of consumers during a grid emergency</td>
<td>Cost effective option made possible by improved efficiency of batteries and declining cost.</td>
</tr>
<tr>
<td>Undergrounding or relocate existing overhead lines</td>
<td>Exposed parts of the overhead network are put underground (e.g. where there is a high occurrence of car vs. pole incidents)</td>
<td>Very expensive with a financial burden on future generations due to the long-life nature of the assets and the write-down of existing assets.</td>
</tr>
<tr>
<td>Network storage</td>
<td>New battery and other storage technology.</td>
<td>Cost effective option due to improved efficiency of batteries and declining cost. Can be scaled over time. Has optionality to relocate when needed.</td>
</tr>
<tr>
<td>Network design changes</td>
<td>Deploy new conductor types (e.g. aerial bundled conductors).</td>
<td>A feasible option based on increasing maturity of the required technology. Challenge to retrofit due to economic write-down of existing conductors.</td>
</tr>
<tr>
<td>Network topology</td>
<td>Add additional circuits by meshing traditional radial lines.</td>
<td>Increase resilience where the customer segment has migrated from rural to urban, typically on the fringes of the network, as the city expands.</td>
</tr>
<tr>
<td>Distributed generation</td>
<td>Where network support is only required for short periods of time, creates permanent connection points for fast deployment of mobile generation during emergencies</td>
<td>A good substitute for building traditional lines with a shorter economic life, which provides more investment flexibility. Can use renewable and/or fossil fuel.</td>
</tr>
<tr>
<td>Temporary generation</td>
<td>Large and small scale mobile generation used to support consumer load during emergencies</td>
<td>Typically fossil fuel generation so has implications for noise and pollution control. Very flexible investment option.</td>
</tr>
<tr>
<td>Provide infrastructure for alternative fuel source</td>
<td>Where economical, electricity can be substituted with reticulated gas networks to provide additional resilience</td>
<td>If reticulated gas exists locally, it could be a cost-effective way to provide alternative heating and cooking options if the electricity network is affected by an emergency.</td>
</tr>
<tr>
<td>Vegetation clearance* outside regulated cut zones</td>
<td>Increase the regulatory cut zone as per the Electricity (Hazards from Trees) Regulations 2003</td>
<td>Need legislation to support a risk based approach to vegetation management and for tree owners to pay the costs associated with managing their trees.</td>
</tr>
<tr>
<td>Third party interference* (e.g. car vs. pole)</td>
<td>Work with government, councils, industry, etc. to mitigate the exposure of the network to third party interference</td>
<td>Ensure the impact of third party interference on resilience is understood and managed collectively.</td>
</tr>
</tbody>
</table>

*These are predominantly outside the control of the EDB. e.g. need to influence legislation, councils rules, other infrastructure providers and consumers in order to make changes.
# INVESTMENT OPTIONS TO IMPROVE INDIVIDUAL ON-SITE RESILIENCE

<table>
<thead>
<tr>
<th>OPTION</th>
<th>DESCRIPTION</th>
<th>COMMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Renewable generation combined with storage</td>
<td>Utilising solar energy to charge a battery during network emergencies.</td>
<td>Very effective investment option targeting individual customer needs. Can be scaled as customer needs change.</td>
</tr>
<tr>
<td>Vehicle-to-Home (V2H) solutions</td>
<td>This option utilises the energy stored in an electric vehicle's battery to supply a home during an emergency enabled by new technology and associated lower price points.</td>
<td>Very effective investment option providing multiple benefit streams to the customer.</td>
</tr>
<tr>
<td>Community generation</td>
<td>The use of privately owned microgrids to support small customer groups during emergencies.</td>
<td>A targeted investment option that caters for the specific needs of the community, e.g., holiday homes.</td>
</tr>
<tr>
<td>Temporary on-site generation</td>
<td>The use of mobile generators to supply critical loads during network emergencies.</td>
<td>Cost effective and flexible option because costs are only incurred when activated, but need time to deploy.</td>
</tr>
<tr>
<td>On-site storage solutions</td>
<td>Standalone storage options such as batteries, flywheels, hot water storage and gas bottles to provide both network and energy substitution.</td>
<td>The price point of these technologies is rapidly coming down, providing cost-effective new, technology-based options for customers. E.g., bottled gas is a cost-effective way to provide alternative heating and cooking options if the electricity network is affected by an emergency.</td>
</tr>
<tr>
<td>Permanent on-site generation</td>
<td>The use of fossil or renewable generation, permanently installed on site, e.g., wind power.</td>
<td>This is a more costly option than temporary generation but it has a much shorter deployment time.</td>
</tr>
<tr>
<td>Private on-site asset management</td>
<td>Ensure on-site assets are maintained, e.g., private overhead lines kept clear of trees, and mitigate the risk around critical systems such as on-site pumped sewerage through dedicated, small back-up generators.</td>
<td>Requires understanding of individual exposure and options available to mitigate the risk.</td>
</tr>
</tbody>
</table>
CUSTOMER CHOICE MATRIX

The matrix below is a tool Vector is developing to support customer decision making regarding the resilience option best placed to mitigate various threats to electricity supply.

The matrix includes both network and individual solutions and attempts to highlight the trade-offs for each potential resilience measure.

**KEY:**
- Squares indicate customer solutions, circles indicate network solutions.
- Size of circle or square indicates ‘cost effectiveness’ of the resiliency solution.
- Red indicates a higher impact on future generations, blue indicates lower impact.
Item 5.1

The Policy and Regulatory Framework to Support Shared Resilience
REGULATORY CHANGE TO ENCOURAGE RESILIENCE

A SHARED UNDERSTANDING OF RESILIENCE

- Designing an agreed definition and metric of resilience would support the quantification of risk and implementation of measures that could improve resilience.

- While it is important to develop a widely agreed concept of what resilience is, it is also essential that a framework for achieving resilience (and not simply reliability) is recognised in regulation and by regulators and policy makers. Industry participants cannot be expected to provide resilience for New Zealanders, while being hindered in their ability to achieve it under regulatory frameworks that do not recognise the significant impact of climate change, or the increasing criticality of electricity, for example.

RESILIENCE REGULATION

- The only official act that enforces resilience is the Civil Defence and Emergency Management Act (2002) that specifically discusses the duties of lifeline utilities.

- MBIE’s Technical Working Group on Climate Change Adaptation was established in November 2016 to advise the government on how to build resilience against climate change and a stocktake report was released in 2017 to help build an industry-wide understanding of risks associated with Climate Change. However, no further resilience policy and governance structure is in place to promote resilience.

- The current regulatory framework is focussed on reliability rather than resilience, based on historical benchmarks. This does not recognise the exponential changes that are occurring due to new technology and climate change. A renewed focus must be given to developing:
  - an agreed upon concept of resilience;
  - an appropriate framework for measuring resilience to assess industry participants’ success; and
  - regulatory recognition of the resilience framework to ensure there are appropriate incentives for action.
REGULATORY CHANGE TO ENCOURAGE RESILIENCE

RESILIENCE CONCERNS WHICH SHOULD BE RECOGNISED UNDER REGULATION

- Forecasting extreme weather - forecasting is essential to improve preparedness and evaluate the benefit of infrastructure investment. Capturing the impact of climate change on weather patterns will be increasingly important to make long-term infrastructure planning decisions. Historical data alone fails to capture the changing weather patterns. The investment needed to undertake essential forecasting, as well as the necessary data required, must be enabled and supported by regulators.

- A business case and financial mechanisms for resilience initiatives - Resilience is an important consideration for the economy and all initiatives need to find the right balance between prevention and response. Traditional business case approaches only consider normal operation and do not recognise the value of certain investments alternatives in increasing resilience, which slows down the deployment of new energy technology and analytics that can make vital contributions. A paradigm shift in financial mechanisms and business case modelling is required across industry and government.

- Regulation to encourage investment in new tech - Regulatory support of new technology is essential to increase business certainty. The long-term investment recovery framework for poles and wires increases the risk of investment stranding and new technology solutions provide credible alternative for networks to renew and adapt to changing energy needs of consumers. Consideration for accelerated depreciation must be given at the pace of change accelerates.

- Widening investment considerations to allow for resilience - Under the current regulatory framework spending is based on historical benchmarking, however what has been done previously, will no longer be appropriate to ensure resilience in future. Following Superstorm Sandy and the extensive damage done to regional distribution systems and substations, the New Jersey Board of Public Utilities approved more than $1 billion for hardening and modernizing Public Service Enterprise Group (PSEG) electric and gas infrastructure.

- Recognition of climate change - Climate change resilience is not currently considered by the Electricity Authority and Commerce Commission, which discourages appropriate investment and appears to run counter to the government’s stated aims of achieving carbon neutrality. Climate change must be recognised across all regulation and regulators, not confined to climate legislation.

- Access to data - Data is increasingly important for the resilience of the energy sector. Due to a quick in the market structure, most electricity retailers refuse to share timely and sufficiently granular data, jeopardising the resilience of electricity networks. Regulators must recognise the public value inherent in leveraging New Zealand’s successful smart meter roll out for the benefit of network planning. As experience by Vector in the recent April storm event access to data is an essential component of adaptability and recovery from adverse events. Vector had limited oversight of the outages on its network at the low v voltage and customer level, and was therefore hindered in its ability to restore power. Timely access to this granular data must be provided to EDCs, as the body responsible for the resilience of our electricity networks.
LEGISLATIVE CHANGE TO ENCOURAGE RESILIENCE

VEGETATION MANAGEMENT REGULATIONS

- The challenge for network companies under the Electricity (Hazards from Trees) Regulations 2003, is that only vegetation in a limited area can be trimmed, essentially where it is almost directly against power lines – the ‘growth limit zone’. This hinders EDBs’ ability to adequately protect the electricity network during adverse weather events, where trees damage power lines from outside of the growth limit zone.

- The Electricity (Hazards from Trees) Regulations 2003 are highly prescriptive as they focus on set distances between trees and lines. For the vast majority of trees, these distances are grossly inadequate. For example, in some cases no action can be taken until a tree branch is as close as half a metre from a line. This is a very small gap and clearly insufficient to prevent trees swaying in high winds to clash with lines. Some trees are also very fast growing and might require two trims a season, which is both costly and inefficient. Fast-growing trees also tend to be less resilient to high winds and therefore pose a greater risk.

- The regulations take account of only two parties – the lines company and the tree “owner”. There can be significant issues identifying the “tree owner”, which can be different to the landowner or occupier. For example, in the case of forestry, the tree owner might be a post office box in Geneva. While tree owners may be difficult to locate and/or communicate with, at-risk trees continue to grow. The two parties must follow a complex process involving the measurements of tree distances within various zones, issuance of formal “cut and trim” notices for every tree, and punitive action procedures to be followed. While the failure to obey a cut and trim notice could result in a theoretical $10,000 fine, there is no record of a fine ever being imposed.

- Even after a tree is cut the problem persists. While a newly-pruned tree might be physically separated by up to 1.5m from a line, the tree might tower many metres directly above a line, meaning branches can fall across conductors, shorting them out or bringing them down.

- There is an urgent need to move to a modern, principles-based framework, which allow EDBs to carry out and act on risk assessments for trees near power lines and oblige tree owners to take more responsibility for their own trees. The risk assessment could include factors such as: customer numbers that might be affected by an outage, tree species, age and condition of tree, overhanging branches and fall distance, issues of public safety, risk of fire etc.

- A review of the tree regulations by MBIE was signalled three years ago, in the government’s infrastructure plan released in 2015. A review was timetabled to be carried out in the 2017-19 financial years. However as far as Vector understands, no form of vegetation management review has yet to commence.

- In Vector’s view, it is not equitable for lines customers to have the cost of vegetation damage or cutting when the land owners should be accountable for this. Conceptually, simply expecting lines businesses to cut customer owned trees and to spread these across all customers does not align with the principles of cost causation, and is effectively increasing costs to consumers via these tree owners avoiding the cost of managing the trees and creating an impetus onto electricity consumers.
CASE STUDIES FOR SHARED RESILIENCE
VECTOR CASE STUDY IN SHARED RESILIENCE

- V2H (Vehicle to Home) is an innovative solution that allows customers to supply their home with the energy stored in an electric vehicle (e.g., Nissan Leaf). This is of great benefit to customers, especially during network outages.

- Vector is the only utility in Australasia trialing 3kW and 6kW V2H units. Figure B depicts the combination of loads that could be supplied using a 6kW V2H solution.

- Using a 25kWh Nissan Leaf EV, a residential customer could supply a 6kW load for more than four hours and a 3kW load for more than nine hours. Also, in an extreme situation a PHEV such as the Mitsubishi Outlander could run for longer time periods as the engine acts as a generator and will drive the V2H unit for as long as the car is fuelled.

- An example of a cost-effective, non-network alternative to network reinforcing that gives the customer choice and control.
In remote locations, ensuring resilience with traditional network solutions is often cost-prohibitive relative to the number of customers served. In addition, climate change is creating access issues across Vector’s network through road and land slips. This is where microgrids become economic to deploy.

Most microgrids are network connected but can ‘island’ themselves in the event of a network outage. This enables microgrids to provide those connected to them with backup power and improves electricity resilience to remote communities in a cost effective way.

Kawakawa Bay is a remote, coastal community, supplied via a 11kV feeder that follows the road across a precarious landscape. The road is very susceptible to slip and the effects of climate change means it is happening more often. There is no practical way to run a different supply into the area. Vector is deploying a 3MW/1.7MWh microgrid to improve the resilience of the network. This option has the full support of the local community.
INTERNATIONAL CASE STUDY

MICROGRIDS IN AMERICA AND JAPAN

JAPAN

The Fukushima disaster in March 2011 triggered a discussion on resilience. A new growth strategy called “Rebirth of Japan” was formulated that emphasised the development of smart grid innovation as a vehicle to increase disaster resilience. (Ref. 2)

The Japanese government has supported this with a “National Resilience Program”, which provided 3.72 trillion yen/$33.32 billion in funding for the 2017 fiscal year, which will be increased by 24 percent in 2018. The programme has spurred the creation of microgrids and distributed power generation across Japan, reducing municipalities dependence on large power plants.

The city of Higashi Matsushima, with 40,000 inhabitants, chose to construct a self-sustaining system capable of producing an average of 25 percent of its electricity without the region’s local power utility. In the case of a severe event that cuts supply to this small city, the independent microgrid with its solar PV panels, biodiesel generators and batteries can run the city for at least three full days.

AMERICA

The Borrego Springs microgrid was developed from an existing utility circuit as a “proof-of-concept” (Ref. 1), in a remote area of California. The project demonstrated that the microgrid could reduce the peak load on the circuit by 15 percent or more, and energy storage was shown to firm the intermittency of rooftop solar photovoltaic (PV) systems. Most importantly, it demonstrated the ability to island and out an entire microgrid seamlessly in order to improve resilience:

- **Planned Outage** (June 2012) the microgrid provided power to 2,126 customers for 5.5 hours;
- **Planned Islanding** (Q1 2013) Conducted seven islanding events over three days;
- **Windstorm** (April 2013) the microgrid provided power to 1,225 customers for 6 hours;
- **Flashflood** (August 2013) CES units islanded six customers for 5.5 hours; and
- **Intense Thunderstorms** (September 2013) the microgrid provided power for up to 1,056 customers for more than 20 hours.

International Case Study

Keeping the Lights On During Hurricane Sandy

- Hurricane Sandy left 8.5 million people without power in 21 American states – the highest outage total for any American extreme weather event in history and the second-costliest hurricane ever to hit America (after Hurricane Katrina).
- While most of downtown Manhattan had no power, New York University's 13.4 MW CHP plant and self-sufficient microgrid system, which distributes electricity independently, supplied electricity to 26 of its buildings.
- In the year after Sandy (2012-13), America dedicated $56 million to microgrids (Ref. 3).
- In 2014, the North-eastern states spent $84 million on microgrids, with at least one in nearly every state. The State of Connecticut had one microgrid before the storm, now it has eight. New York went from 10 microgrids pre-storm to 17, while New Jersey jumped from three to seven.

New York during Hurricane Sandy, photo credit Iven Bean

INTERNATIONAL CASE STUDY

SUPERSTORMS DRIVE INVESTMENT OPTIONS AT CONSUMER LEVEL

Severe weather is the leading cause of outages in America, causing over 97% of outages (Ref 4), and the American Department of Energy has recognised that the frequency and intensity of storms are increasing. Seven of the ten most costly storms in American history occurred between 2004 and 2012 (Ref 5).

Superstorm Sandy in 2012 is now often credited with changing the face of America’s grid, after leaving 8.3 million people without power in 21 American states.

Importantly, in New York State it has led to the REY (Reforming the Energy Vision), aimed at, amongst others, building a more resilient energy system by giving consumers more options to procure and control their consumption at individual level:

4. Quoted in Resilience: How Superstorm Sandy Changed America’s Grid. Steven Wachs, Steven Lacey, June 10 2014.

Meanwhile, technological innovation and increasing competitiveness of renewable energy resources, combined with aging infrastructure, extreme weather events, and system security and resiliency needs, are all leading to significant changes in how electricity is generated, distributed, managed and consumed. Regulatory changes under the REY initiative are promoting more efficient use of energy, deeper penetration of renewable energy resources such as wind and solar, wider deployment of "distributed" energy resources, such as micro grids, vehicle to grid solutions, roof-top solar and other on-site power supplies, and storage. It is also promoting markets to achieve greater use of advanced energy management products to enhance demand elasticity and efficiencies. These changes, in turn, will empower customers by allowing them more choice in how they manage and consume electric energy. (Ref 6)
INTERNATIONAL CASE STUDY

HURRICANE SANDY AND THE IMPACT ON THE UNDERGROUND NETWORK

- During Hurricane Sandy, the storm surge sent water into many underground substations in New York City. Restoring a flooded substation takes much longer than restoring a downed power line that’s been damaged by ice or wind because you have to deal with the large amounts of water, rust, and mud left trapped in the structure. (Ref. 7).
- Switchgear, relay panels, transformer fans, pumps, and control kiosks are among the most susceptible pieces of substation equipment. Once all the water has been pumped out, each piece of equipment must be thoroughly dried and cleaned; even small amounts of moisture and dirt can render some electric equipment inoperable.
- While almost half of the outages during Hurricane Sandy were caused by overhead line failure, customers affected by unexpected substation flooding experienced more significant outage durations.
- Customers with overhead line damage had service returned by day 17 after the storm, while those who had suffered outages caused by underground equipment flooding were without power even after day 17. (Ref. 8).

Percentage of customers still without power for days after the super storm passed

8. Massachusetts Department of Energy Resources (2014), Feasibility study for undergrounding a subtransmission line in Massachusetts.
VECTOR’S ONGOING INVESTMENT IN UNDERGROUND LINES

- Vector’s published Asset Management Plan forecast an average investment in new underground lines of 21% of total capital expenditure. This includes investments in underground lines for new subdivisions and asset relocations, as required under the Unitary Plan.

- This compares favourably with the data provided by USA utilities to the EEI shown in Figure C. (Ref. 11)

Figure C: Percentage underground investment of total capex (USA utilities)

The Edison Electric report (86) polled USA electric customers concerning their willingness to pay for undergrounding after Hurricane Sandy. The results indicated that 60% of electric customers were willing to pay at least $20 percent more on their power bills for undergrounding and another 11 percent of customers were willing to pay up to 20 percent more. (Figure 3)

However, fewer than 10 percent of the customers polled were willing to bear a bill increase of 100% to pay the more realistic cost for undergrounding. This information confirms the experience of most utilities and state commissions that the cost of undergrounding is a key determinant of customer tolerance for higher costs for utility services to pay for undergrounding. (Ref. 12)
VECTOR’S NETWORK IS MORE UNDERGROUND THAN ITS PEERS

- Vector’s network is 55% underground. The average percentage of undergrounding across NZ EDBs is 27%.
- Figure F gives a comparison of where Vector sits compared to all 29 EDBs in New Zealand, based on the number of ICSP/km², while Figure G shows the % underground in AU.
- Another example is Japan. Its electricity system is dominated by overhead lines. In Tokyo, only 7% of the electricity lines are underground and for Japan as a whole, only 1% are underground (Ref. 13).

**Figure F: Percentage undergrounding in NZ**

**Figure G: Percentage undergrounding in AU**

<table>
<thead>
<tr>
<th>STATE</th>
<th>CITY</th>
<th>% UNDERGROUND</th>
</tr>
</thead>
<tbody>
<tr>
<td>Victoria</td>
<td>Citypower (Melbourne city)</td>
<td>40%</td>
</tr>
<tr>
<td></td>
<td>Jamena (North West metropolitan Melbourne)</td>
<td>30%</td>
</tr>
<tr>
<td></td>
<td>SP Ausnet (rural Victoria – rest of state not covered by Powercor)</td>
<td>14%</td>
</tr>
<tr>
<td>Queensland</td>
<td>Egon Energy</td>
<td>6%</td>
</tr>
<tr>
<td></td>
<td>Essential Energy (rural NSW)</td>
<td>5%</td>
</tr>
<tr>
<td>NSW</td>
<td>Ausgrid (Sydney, Central Coast and Hunter Valley)</td>
<td>35%</td>
</tr>
<tr>
<td>Tasmania</td>
<td>TasNetworks (One DNSP for State)</td>
<td>11%</td>
</tr>
<tr>
<td></td>
<td>TasNetworks (One DNSP for State)</td>
<td>10%</td>
</tr>
<tr>
<td></td>
<td>SA Power Networks (one DNSP for State)</td>
<td>10%</td>
</tr>
<tr>
<td>ACT</td>
<td>EvoEnergy (One DNSP for region)</td>
<td>55%</td>
</tr>
</tbody>
</table>

13. [https://www.japantimes.co.jp/community/20110314/area-new-look-beaver-see-no-costs-are-w-1655680r](https://www.japantimes.co.jp/community/20110314/area-new-look-beaver-see-no-costs-are-w-1655680r)
ESTIMATED COST TO UNDERGROUND THE VECTOR NETWORK

Cost for rural Auckland
$1.9B

Cost for urban Auckland
$3.6B

Additional $60 line changes as for the average customer compared to 700S/year today.
Assuming the regulator will allow the expenditure.

Additional $570 line changes as for the average customer compared to 700S/year today.
Assuming the regulator will allow the expenditure.

These estimates exclude the significant additional costs other infrastructure providers such as Auckland Council, Auckland Transport and Chorus will incur to relocate, reconnect and reinstate their services.

Attachment B

Item 5.1
The estimated cost to underground the network does not include the following, additional costs:

- Write-down of the economic life of existing overhead assets;
- Ground conditions, which affect the feasibility of directional drilling and may require more expensive rock breaking and open trench works (Figure 1);
- Economic impact on businesses, with potential for delay and increased construction cost as some public works can only be carried out outside business hours;
- Traffic management cost and increased traffic congestion cost given that many electricity lines will need to be buried under many Auckland roads (Figure 1);
- Underground congestion due to other utility services could do-rate cables; and
UNDERGROUNDING
AUCKLAND’S RURAL NETWORK

Rural Auckland is a large part of our service territory. If we only buried 5% of Auckland network, it would take us a long time to complete. In rural settings, the construction cost is very high due to local conditions. But the very low population density means that the overall cost is lower than in an urban environment.

Overall, the lower construction cost outweighs the maintenance costs in rural areas. The low population density also means that the benefits from increased resilience are smaller.
In early December 2002, a major ice storm blanketed much of North Carolina with up to an inch of ice, causing an unprecedented power outage to approximately two million electric utility customers. In the immediate aftermath of the storm, the public expressed considerable interest in burying all overhead power lines in the state. (Ref. 14). A public undergrounding feasibility study was kicked off, which released the following recommendations in November 2013:

- Underground lines would be prohibitively expensive as it would cost approximately $41 billion, nearly six times the net book value of the local utilities’ current distribution assets, and would require approximately 25 years to complete. (Ref. 15)

- For customers, the ultimate impact of the capital costs alone on an average residential customer’s monthly electric bill would be an increase of more than 125%. Rates would also be impacted by the higher operation and maintenance costs associated with direct-buried underground systems, particularly in urban areas, where underground conductors are four times more costly to maintain than overhead facilities.

- Investor owned utilities in North Carolina compiled five years of underground and overhead reliability data and found the frequency of outages on underground systems was 50% less than for overhead systems, but the average duration of an underground outage was 38% longer.

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Vector has designed a new generation of public street poles, i.e. the “Smart Power Pole” (Figure K), that hosts various public services such as efficient LED street lighting, electric vehicle (EV) charging, telecommunication equipment and air pollution sensors, whilst integrating aerial bundled conductor (ABC) at a height out of most houses’ line of site and above many tree heights to make it less susceptible to vegetation. Using ABC increases the resilience of overhead lines without the high construction cost, longer outage restoration times, and public disruption of undergrounding, in contrast with traditional non-insulated lines, an ABC line will continue to operate when in contact with tree branches as the insulated conductor will protect against flashovers. Low voltage ABCs are used on every continent and in a total of approximately 80 countries (including Australia, Ireland, UK, France, Sweden). France’s long history using ABC goes back to the mid-1950s. Today, 83% of all low voltage overhead lines in France are bundled, which represents 45% of all low voltage lines (if undergrounded lines are included) (Ref. 16).

The experience overseas summarises the advantages of ABC as:

- Visually less intrusive;
- Reduced tree clearance required due to compact design - in France, low voltage ABC has reduced tree curving by a third;
- Cheaper, easier and quicker to install than underground cables;
- Improved safety, and
- Improved reliability in comparison with bare conductor overhead.
NEW TECHNOLOGY OPTIONS
- DISTRIBUTION AUTOMATION AND SMART METERING

DISTRIBUTION AUTOMATION (DA)
Vector is deploying more DA to increase visibility and controllability of the distribution system by installing additional devices such as remote fault indicators and reclosers. Automated feeder switches, used in conjunction with reclosers, open and close a feeder section without the need to dispatch a linesman. Distribution automation improves resilience through:

- Sectionalisation - limiting the damage on a distribution circuit and minimising the number of customers affected;
- Diagnosis - the smaller the network is sectioned, the quicker a fault can be located and
- Restoration - automatic restoration can be done remotely and does not require dispatching of resources.

Vector has deployed 300 high voltage auto-recloser programmes since 2007. As outlined in the 2018 Asset Management Plan, Vector will invest $26.3M to increase the automation of switching points, using a remotely controllable reclosers and smart analytics; and increasing the number of auto-reclosers on urban feeders.

SMART METERING
Vector uses its SCADA network to monitor and control the high voltage network, but has limited oversight of the low voltage and individual customers level.

Smart meters at customer premises could provide valuable information on the low voltage network during disruptive storm events that can accelerate and streamline the diagnosis of faults and the restoration effort.

Smart meters are equipped with outage notification capabilities that allow the devices to transmit a "last-gasp" alert when power to the meter is lost. The information can be integrated into Vector’s outage management system (OMS) to provide an additional way to pinpoint the outage area and help to assess the damage.

Smart meters can also transmit "power on" notifications to operators when power is restored, or even allow utilities to "ping" meters in the affected areas to assess the outage boundary and verify the restoration progress, enabling field crews to be deployed more efficiently, thus reducing the restoration time.

In New Zealand, smart meter data is held by the retailers and not accessible to electricity distribution businesses. This barrier means that the customer benefits from smart meters in improving reliability and resilience remains untapped.
**INTERNATIONAL CASE STUDY**

**DISTRIBUTION AUTOMATION AND SECTIONALISATION IN US**

The Chattanooga Electric Power Board (EPB) installed more than 1400 automated feeders with the corresponding communication and information management. This was financed through a US$111M stimulus grant from the Department of Energy (DOE) through its Smart Grid Investment Grant program (authorized by the 2009 American Recovery and Reinvestment Act). The project entailed installing a dedicated fibre-optics communications system and smart distribution to deliver the following benefits:

- **Resilience** - Automatic reconfiguration prevented outages for many customers (purple in Figure L) and significantly reduced the number of circuits requiring manual repairs (green in Figure L). The installed fibre-optics network allows EPB to manage a greater number of restoration crews following a storm event. In a July 2012 derecho that affected half of EPB’s customers, EPB’s response was up to 17h faster because of the automated feeder switches, which restored power to 40,000 customers instantly. (Figure M)

- **Financial Savings** - Annual savings of US$200k due to a decrease in the number of dispatched restoration crews.

**Figure L:** Service disruption from a major storm in distribution area of Chattanooga Electric Power Board.

**Figure M:** Automation has greatly reduced the number of customer-hours of outage experienced.

INTERNATIONAL CASE STUDY

SMART METERS PROVIDING RESILIENCE DURING HURRICANES

The US has achieved widespread, measurable improvements in grid resilience under the 2009 American Recovery and Reinvestment Act, which resulted in grants for 99 Smart Grid Investment Projects.

HURRICANE IRENE (2011)
- More than 6.5 million people in the United States lost power during Hurricane Irene (Ref. 33). Smart grid investments made before Irene’s landfall lessened the storm’s impact for thousands of electric customers. Investments in smart meters improved outage notification and response time, greatly reducing the duration of outages. In Pennsylvania, the Pennsylvania Power & Light’s (PPL) smart grid investments in distribution automation technologies made a difference for 389,000 customers who lost power.

HURRICANE SANDY (2012)
- Hurricane Sandy hit the East Coast in October 2012. Smart meter investments made by the United States Department of Energy’s Smart Grid Investment Grant reduced the impact for thousands of electric customers.
- In the Washington D.C. metropolitan area, the Potomac Electric Power Company (PEPCO) said it was able to restore power to 130,000 homes in just two days after Sandy thanks to smart metering infrastructure. With smart meters connecting roughly 425,000 homes, PEPCO received "no power" signals that allowed them to quickly diagnose and locate outages.
- Even after the power was restored, PEPCO was able to continually "ping" meters to verify that service was restored, which avoided the need to send repair crews.

MID-FEBRUARY 2014 NORTH AMERICAN WINTER STORM (REF 35)
- In Pennsylvania, the resilience benefits from smart meters can be highlighted by comparing the difference in restoration times after Hurricane Sandy in 2012 with 10 percent smart meters deployed and the winter storms two years later with 50 percent smart meters deployed. Following a February 2014 storm, PEPCO restored service an estimated three days faster, and automatically restored about 37,000 customers in less than five minutes using Automated Meter Reading (Ref. 35).

Florida utility, Florida Light and Power (FLP), noted that investments of $2.68 resulted in fewer outages and faster restoration times during Hurricane Matthew. These investments included:
- Automated switches, which prevented at least 26,000 outages; and
- With more than 4.8 million smart meters, FLP was able to identify which customers were impacted in real time and schedule faster, less expensive responses.

17. The White House (2013), Economic benefits of increasing electric grid resilience to weather outages
19. DOE (2014). Smart grid improves grid reliability resilience and storm response
Attachment A

Item 5.2
The Geography of the Auckland to Hamilton Corridor

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E: Ben.R001@gmail.com
Focus: the Upper North Island

The central themes around this inter-regional planning are the following:

- Most urban growth both residential and industrial will be in Southern Auckland
- Industry is decamping from the Southdown-Onehunga complex and moving into Southern Auckland as land use competition with residential and commercial heats up on the Auckland Isthmus
- Heavy industry seeks out lower land values with good connections and little land-use competition as mentioned above
- Population is spilling out of Southern Auckland and like industry will seek provincial places in the northern Waikato
- State Highways 1, 2, 27 and 29 form the road spines while the North Island Main Trunk Line and the East Coast Main Trunk Line form the rail spines between Auckland, Hamilton and Tauranga
- The Golden Triangle forms 50% of the national population and 50-60% of national GDP
- Role of Manukau City Centre into the future

Ben Ross. 2018. Geography of the Auckland to Hamilton Corridor
Population load spreading – saving the Provinces and Auckland at the same time

- Rapid urbanisation has seen provincial centres without decent industry hollow out while the main urban centres continue boom and expand. This is not healthy for either and can create imbalances both economic and social that impair the economy.
- Whether industry moves to the provincial centres or not population load spreading (that is Auckland loses some of its population to its Satellites in the south) can act as a control rod to the reactors that are our major urban centres. As noted by Regional Rapid Material literature; Auckland to Hamilton would be 70 minutes
- If Manukau City Centre and its big industrial complexes step up then a commute from Huntly to Puhinui or Manukau becomes even shorter.
- If a smaller satellite is not for you then Hamilton or even Tauranga is always available for you to live while being connected back to Auckland via the rail system.

Ben Ross. 2018. Geography of the Auckland to Hamilton Corridor
Employment and Industry spreading

- Like with population rapid urbanisation consolidated heavy industry away from small towns and into the big urban centres gutting those smaller towns. Projects like the Waikato Expressway will bypass and further harm these towns (like Huntly) so enter rail to turn things around.

- Remember: **Assist the creation of affordable housing supply that is well-connected by congestion-free transit. Use transit focused residential development to catalyse the local economies of northern Waikato towns, which face potential economic decline by being bypassed by the new Waikato Expressway.** Source: Greater Auckland

- Heavy industry as Auckland continues to expand will seek out places where land-use competition is not intense. Smaller provincial centres connected up by decent passenger and freight rail would be in the box seat to receive these industries as they move around. This has two positive consequences:

  1. Smaller urban centres increase their local employment base
  2. Diversified employment base better protects the smaller centres from the fluctuations of the economy

Ben Ross. 2018. Geography of the Auckland to Hamilton Corridor
Transform Manukau Framework Plan
Source: Panuku Development Auckland

Ben Ross. 2018. Geography of the Auckland to Hamilton Corridor
Airport to Botany (A2B) Rapid Transit, Puhinui Station and Auckland International Airport

- Airport to Botany (A2B) RTN is a rapid transit link (hopefully light rail) from Manukau to the Airport via Puhinui Station that connects up with both the commuter rail/bus services and the Regional Rapid Rail lines.
- This means you could catch a train from the Waikato or Tauranga up to Puhinui Station, transfer to the A2B Line at Puhinui and continue on a second train to the Airport without the hassle of driving or arranging van shuttles (subsequently risking fouling of any of the State Highways on the way to the Airport).
Talking Southern Auckland

Conversations and Collaboration with You on The South

Urban Geography: The Ultimate Expression in Inter Regional Spatial Planning, Developments and Behaviours

Written by Rex Ross - Talking Auckland

Looking at inter-regional spatial planning

Planning Committee
04 September 2018

31/08/2018

Urban Geography: The Ultimate Expression in Inter-Regional Spatial Planning, Developments and Behaviours – Taking Southern...

Somewhat interestingly a job advertisement from a Government agency (okay it was NZIA) had me revisiting a previous post I wrote last year on inter-regional spatial planning. The original post can be read here and was used as a guest lecture to the University of Waikato at the time (see Guest Lecture: Inter-Regional Planning and Sustainability (https://voxki.net/2017/08/20/guest-lecture-inter-regional-planning-and-sustainability/)).

The post was written in the election campaign and the dying days of the National Government. Since then the Government has changed and the Transport, Housing and Urban Development Minister (THUD) Phil Twyford has changed the course on what is effectively spatial development in an entirely new direction. As a consequence of the change of direction reviewing my Inter-Regional Planning post was always going to be on the cards. However, as I stated in my opening lines a job advertisement from NZIA (was for Behaviour Insights) has me looking at spatial planning from another lens.

The advert was looking for those with skill sets who can find, analyse, build capacity (for the agency) and deliver ideas on both behaviour and how behaviour can be influenced when decisions are being made – in this case transport. My Urban Geography, Urban Planning, Urban Design and Engineering: We are in a Mess Folks (https://voxki.net/2018/04/23/urban-geography-urban-planning-urban-design-and-engineering-we-are-in-a-mess-folks/) critiqued how we approach behaviours within an urban environment and its spatial development. So if we draw the two strands together how we approach Inter-Regional Planning or spatial planning is able to be refined down in what we need to do.

Urban Geography

- Spatial development of towns/cities
- Variations between cities
- Variations within cities

(https://voxki.files.wordpress.com/2017/02/urban-geography.jpg)

https://www.slideshare.net/lwilberg/cities-11-urban-geography-111
(https://www.slideshare.net/lwilberg/cities-11-urban-geography-111)

Urban Geography as the ultimate expression in behaviour

I am going to do a brief recap from my Urban Geography, Urban Planning, Urban Design and Engineering: We are in a Mess Folks (https://voakl.net/2018/04/23/urban-geography-urban-planning-urban-design-and-engineering-we-are-in-a-mess-folks) post on the hierarchy that exists with planning the urban form:

Thus if we adopt what Flyt and I would approach a City matrix it would go something a bit like this:

1. **Urban Geography** at the top: First up would be your spatial development, its variations and how we would want the City to be. By its very nature Urban Geography (or Geography as a whole) puts the physical and human geographies (also the main two sub disciplines of Geography) first thus when it comes to spatial developments itself those previous geographies come into the fore. Effectively using the limitations and opportunities presented by the physical and human geographies in a set area how do I want my urban place and environment to evolve. Note I said evolve not build. Build is something as an Urban Geographer I am not overly “fussed with” as I have urban planners and designers who are more nuanced for this kind of stuff.

1. If this was done in Cities Skylines I take my map and go this is how I want my City to evolve and these are the parameters the physical and human geographies present me. Thus I take broad brush strokes on where I want things roughly taking into account the evolution of the City.

2. At this level it is the only time I would be dabbling with engineering matters – that is my inter-regional road, road, shipping and air connections. What are my inter-regional transport connections and how will they influence the spatial development and evolution of my City. This is bearing in mind Form rather than Function takes priority so those connections will need to be conscious of place making, Manukau City Centre is a classic example of this with its rich inter-regional connections and its surrounding industrial complexes influencing its Form.

2. **Next up is Urban Planning and macro-level Urban Design.**

1. With the spatial development road map laid out it now comes to the Planners to begin stage 1 of the execution – the placement of the zones and with urban designers mapping out the placement of the civic infrastructure (parks). Typically for a City to get going and capitalise on the inter-regional transport connections you start with industry zoning then residential and finally commercial. As a side note this is why South Auckland is functioning well in its continued urban evolution and West Auckland is not. This is because the South built itself around industry (that includes farming) followed by residential to service that industry then the commercial to service both. West Auckland seems to be doing the reverse by doing the commercial first (Westgate) then the residential (Hobsonville Point) and then industry as an afterthought – and subsequently I wonder why State Highway 16 is burgled each day….. Planners along with the Engineers will also need to map out the bulk infrastructure (water, waste-water) and storm water. Planners will also need to prepare the intra-city transport routes and hubs for the engineers to build as well. In Auckland and Cities Skylines this would be the Unitary Plan.

2. **Urban Design**: Urban Design comes in at this stage of the game as place making starts right away once the zones and the infrastructure mapped out. You are thinking why urban design now when the roads and pipes are not down yet. Remember how I said form over function? I am looking at place making over just movement and yes this also includes place making with industry. This is because if you don’t start you place making straight away even your industrial complexes end up in a mess making it harder for transport to serve them well. Also given developments do tend to cluster around transport routes and hubs (passenger and freight) urban design also becomes paramount if we are to support the spatial development and urban evolution of the City. In Cities Skylines this is parks and transport hub placements (note: give game mechanics I will need basic (main) intra
31/08/2018  

Urban Geography: The Ultimate Expression in Inter-Regional Spatial Planning, Developments and Behaviours – Taking Southern...  

city road and rail down first to allow placements of parks and transport hubs, a city would be similar to this aspect.

3. Engineering: I have the maps, I have the zones, I have some basic road and rail, I have parks and I have transport hubs. Now to back this all up and this is where engineering comes in. To build the arteries and veins that will support the spatial development of the City and its constant evolution. Please note: Engineers will always be involved with geotechnical matters right through the process as things like peat soils and hills will (in this instance) give physical geography limitations to what we can develop here. Notice how I said build and not design the City and its support mechanisms – this is constant with what Flyt said and I strongly believe in. In Cities Skylines this is the pipe and plant build and wider road placements (the stuff that frustrates me and is time-consuming the most).

...And that is the matrix I would use when it comes to the spatial development and evolution of our urban areas.

......

This is how as an Urban Geographer I see the discipline of Urban Geography forming the ultimate expression on behaviour and influencing behaviour of both the urban form AND those who reside, work or visit it.

Looking at Urban Geography and Inter-Regional Spatial Planning bearing in mind the changed Environment owing to the Labour-led Government in power instead of National

Urban Geography at Work: Inter-Regional Planning and Sustainability

https://voaki.files.wordpress.com/2018/04/20180401155601_1.jpg

Urban Geography, Urban Planning, Urban Design and Engineering – all in action in Cities Skylines

Relief value for Auckland, Lifeline for the Provinces

Since the coming to power of the Labour, New Zealand First and Greens Government the direction in which transport, housing and urban development is to take will change significantly to the hands-off, roads first and anti urban National Government that preceded it. For starters we have a Transport, Housing and Urban Development Minister – Phil Twyford. Second, the Minister of THUD – Phil Twyford has issued very clear directions on where transport, housing and urban development is to head.

While we await the first half of the Urban Geography ledger – the Housing Commission Urban Development Authority (some 17 months away) Minister Twyford is cracking on with the second half of that ledger – the Government Policy Statement on transport (the Auckland Transport Alignment Program is out today). You can read up on the GPS here Government Releases Draft Government Policy Statement for Consultation (Due May 2) (https://voacl.net/2018/04/04/government-releases-draft-government-policy-statement-for-consultation-due-may-2/).

The GPS makes a massive play on using the transport system to build communities thus influence behaviours of both us and the urban form as highlighted below:

![Diagram](https://voacl.files.wordpress.com/2018/04/gps-labour-strategic-priorities.jpg)

Attachment B

31/08/2018  Urban Geography: The Ultimate Expression in Inter Regional Spatial Planning: Developments and Behaviours – Taking Southern …

Section 2.6: Transitional rail funding

Attachment B

The second-stage GPS will move us further towards transport creating a New Zealand where people and businesses can thrive by:

- reflecting transport’s role in the urban development agenda
- developing local and central government agreements on transport’s role in the future development of metro areas such as Auckland, Wellington and Christchurch including consideration of transport’s role as a place-maker and on future rapid transit options
- considering all modes when providing the best access solution, which will include investigating funding for alternative transport modes, such as rail and coastal shipping.

Second Stage GPS that includes more on rail and also Coastal Shipping Source: New Zealand Government

Integrated Land use/Transport Planning in the GPS. Source: NZ Government

Planning Committee
04 September 2018

Inviting public spaces

71. Creating spaces within the streetscape that are attractive and safe for people to sit, gather and walk and cycle supports the objectives of creating a safer and more accessible network, as well as key outcomes around improving health and well-being.

72. Well designed, attractive public spaces provide residents with places to gather, and attract people to frequent local businesses, connect with their neighbours and partake in recreational and cultural activities.

73. GPS 2018 will support investments that make streets more inviting places for people. This should encourage more housing development in these areas and more city living.

Source: Draft GPS


Using Transport to create public spaces. Source: GPS via NZ Government

NZIA are going to have their work cut out for them with integrated land use/transport planning, and using transport to create public spaces but I have faith our national transport agency is more than up to the task in starting this work and then partnering up with the eventual UDA and its satellites in 17 months time. I also wrote on how the GPS is in fact more than just transport it is a community builder. The Government Policy Statement, More Than Transport It Is Also a Community Builder (https://voakl.net/2018/04/09/the-government-policy-statement-more-than-transport-it-is-also-a-community-builder/) As soon as we start using transport as a community builder we are focusing on the form (place making) rather than function (all about the flow) thus we are beginning to dabble in Urban Geography. Urban Geography being that of spatial development of towns and cities, their variation between those cities and within those cities. You are effectively now using Urban Geography to influence behaviour.

Going out to inter-regional spatial planning levels we look at how inter-regional transport links become the key expression in influencing spatial development behaviours (all are still considered under the parent of Urban Geography). Again:

**Urban Geography at the top:** First up would be your spatial development, its variations and how we would want the City to be. By its very nature Urban Geography (or Geography as a whole) puts the physical and human geographies (also the main two sub-disciplines of Geography) first thus when it comes to spatial development itself those previous geographies come to the fore. Effectively using the limitations and opportunities presented by the physical and human geographies in a set area how do I want my urban place and environment to evolve. Note I said evolve not build. Build is something as an Urban Geographer I am not every “fussed with” as I have urban planners and designers who are more nuanced for this kind of stuff.

3. If this was done in Cities Skylines I take my map and go this is how I want my City to evolve and these are the parameters the physical and human geographies present me. Thus I take broad brush strokes on where I want things roughly taking into account the evolution of the City.

2. At this level it is the only time I would be dabbling with engineering matters – that is my inter-regional roads, road, shipping and air connections. What are my inter-regional transport connections and how will they influence the spatial development and evolution of my City. This is bearing in mind Ferro rather than Function takes priority so those connections will need to be conscious of place making. Manukau City Centre is a classic example of this with its rich inter-regional connections and its surrounding industrial complexes influencing its Form.

This slideshow requires JavaScript.
Remember we are trying to influence:

Access is all about: provides increased access to economic and social opportunities, enables transport choice and is resilient.

Primarily:

- addressing projected declines in access to jobs and education, particularly for people living in the west and the south
- accelerating the development of Auckland’s rapid transit network, with a particular focus on routes between the city and the airport, to unlock housing and urban development opportunities
- developing transport connections that are crucial for linking production points with key distribution points (including routes important for exports, and those inter-regional routes critical for getting local goods to market)

Source: GPS 2018-2021

I am going to recap on the lecture I gave last year on inter-regional planning.

The main points of the lecture (data given is as of August 2017):

- Cities and provinces since the 1990s have been in competition
- Rapid urbanisation and globalisation has seen the provinces hollowed out when industry has moved to Auckland
- Auckland houses 37% of GDP and 34% of the population while growing at 800 new residents a week, this is unsustainable
- Infrastructure both in terms of transport and water are not coping
- Record suicide rate of 600 for the year in part will have come from Provincial centres being hollowed out and no real chances of employment available
- Inter-Regional Planning connects up the smaller Centres with the bigger Centres spreading the population and employment load. Acts as control rods for Auckland
- Tourism potential

The lecture slides can be seen below:

Inter-Regional Planning
Uniting both Urban and Provincial Centres

Looking at how to solve pressures and problems in Urban and Provincial Centres while linking to Sustainability and Planning

Ben Ross. 2017
http://voaki.net
Twitter: @BenRoss_AKL
Facebook: Taking Auckland
@BenRossAKL

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1 of 25

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Uni Lecture Presentation Mk3 (https://voaki.files.wordpress.com/2017/08/uni-lecture-presentation-mk3.pdf)

Updated data:
- Suicides for 2017: unknown as full year figures not out
- Road Death Toll 2017: 380 or similar levels to 2008 after a steadily increasing toll since 2013
- Cost to NZ Economy from road death and injuries: $4 billion/year
- Auckland Economy now worth over $100 billion/year with the nearest region after that pulling in $36b/year
  (Source: Stats NZ)
Auckland
Regional GDP, 2017

GDP value, (billion)

$101.4

37.5% of NZ GDP

GDP per capita

$61,924

Min
Average
Max
All regions

Change in GDP, 2012–17

34.6%

2012
2017

www.stats.govt.nz/regionalgdp

Note: Figures may not sum to totals due to rounding. Source: Stats NZ

Auckland’s regional economy as of 2017.
Source: Stats NZ

Using Urban Geography, inter-regional spatial planning and inter-regional transport planning to influence behaviours”

On March 31 Minister Twyford announced that Regional Rapid Rail, and the Southern Airport Line will start their builds this year (see Regional Rapid Rail and The Southern Airport Line a (virtual) GO! (https://voaki.net/2018/04/01/regional-rapid-rail-and-the-southern-airport-line-a-virtual-go/)). Regional Rapid Rail and the Southern Airport Line would be the two biggest influences in spatial development and behaviour without resorting to blunt force legislation in the Parliament. Regional Rapid Rail links up Auckland, Hamilton and Tauranga with upper North Island provincial centres while the Southern Airport Line (Botany to Airport via Manukau and Puhinui Rapid Transit) links Auckland and the upper North Island to the Airport.

Regional Rapid Rail and the Southern Airport Line
Source: Greater Auckland

I go further into RRR below:

Regional Rapid Rail, Inter-Regional Planning, and a Planning Ministry. Transforming and Unlocking Places

Written by Ben Ross – Talking Auckland

Regional Rapid Rail opens up opportunities

Greater Auckland’s Regional Rapid Rail has certainly opened the discussion on rebuilding the regional rail network across the upper North Island.

From Greater Auckland:

Introducing Regional Rapid Rail

This post gives you a brief summary of our staged proposal to introduce higher speed inter-city rail to the Upper North Island. The full plan and the detail behind it can be seen in Regional Rapid Rail Report (https://drive.google.com/open?id=0B9EZXPytld漱traHwIWy0RClXWZ2c) (8mb). This document looks amazing thanks to the design genius of Cornelius from Frontier for the design – who is also behind our website and the CFN 2.0 Report. You can also see a more detailed version of the maps for Stage 1 (https://drive.google.com/open?id=0B9EZXPytld漱traGxxY3TTkJ2X28), Stage 2 (https://drive.google.com/open?id=0B9EZXPytld漱raQWhnWXRlBDVCM) and Stage 3 (https://drive.google.com/open?id=0B9EZXPytld漱raIDQmha1lnTTA). Feel free to download, print, distribute, draw on, set alight, decorate your room, or re-blog, just remember to cite!

Why Regional Rapid Rail?

The “Golden Triangle” of Auckland, Waikato and the Bay of Plenty now make up over 50% of New Zealand’s population and are expected to account for over 70% of New Zealand’s growth in the future. If we fail to provide the necessary infrastructure, we will miss out on many of the benefits from this coming growth.

We need to provide a step change in intercity transit to leverage this growth proactively, rather than reactively waiting for it to congest the Waikato Expressway and Auckland’s Southern Motorway. With the Waikato Expressway almost complete, what is missing is the maximisation of the complementary rail corridors.

We have the opportunity to create a well-planned, integrated Upper North Island transport system—one that is able to deliver strong economic and social outcomes, including regional development, not just for the area but for New Zealand as a whole.

Regional Rapid Rail will revitalise the existing rail network using modern technology tilting trains travelling up to 160km/h on upgraded tracks. This will allow for much faster trains, providing quick and reliable journeys that are faster than driving and skip the traffic completely. This revitalised network will stitch together the economy of Auckland, Hamilton and Tauranga, and extend the benefits of growth and development of the main centres to their nearby towns and villages. This will provide fast and reliable travel options to regular commuters, business travellers, shoppers, students, local visitors and international tourists alike.

However, Regional Rapid Rail isn’t just a scheme for commuter trains on the trunk line. It is an integrated regional economic development plan for the Upper North Island, based on fast and regular intercity train connections between the cities and towns of Auckland, the Waikato, and the Bay of Plenty.

The proposal has four pillars for success:
- Using the right technology to achieve speed and performance affordably
- Leveraging existing infrastructure
- Providing a frequent, reliable and regular service for all trip types
- Integration with land use and development plans

Strategic Goals

The specific objectives of Regional Rapid Rail are to:

1. Connect major employment and population centres, including central business districts, growing metropolitan areas, employment areas and satellite towns in the Upper North Island.

2. **Deliver a fast and competitive rail service** with a target travel time of 90 minutes from Hamilton to Auckland and under 2 ½ hours from Tauranga to Auckland. The emphasis is on quality of time and maintaining consistent and reliable speeds.

3. **Provide a regular and frequent rail service**, scheduled to suit a range of travel times and trip purposes, serving commuters, tourists, students and residents alike.

4. **Make complementary improvements to the rail freight network**. All upgrades should, at least, not disturb KiwiRail’s ability to move freight now or in the future. Passenger rail network upgrades should also seek complementary improvements that also enhance the efficiency and capacity of the KiwiRail rail freight network.

5. **Assist the creation of affordable housing supply** that is well connected by congestion-free transit. Use transit focused residential development to catalyse the local economies of northern Waikato towns, which face potential economic decline by being bypassed by the new Waikato Expressway.

6. **Link regional transportation to well-planned communities with good urban outcomes**. This should not just be a rapid train network but the means to create vibrant, livable towns and cities that are economically and socially sustainable.

7. **Integrate directly with local public transport, walking and cycling networks**, such as the Congestion Free Network 2.0, to maximise coverage and usefulness.

8. **Deliver environmental benefits** by limiting the growth of long range traffic and reducing pollution and CO2 emissions, assisting New Zealand to meet its commitments under the Paris Agreement.


10. **Ensure value for money for taxpayer investment** by optimising investment in infrastructure where it is most effective, regardless of mode.


Here is the diagram on where the Regional Rapid Rail would go:

[Diagram Image]

31/08/2018  Urban Geography: The Ultimate Expression in Inter Regional Spatial Planning, Developments and Behaviours – Taking Southern...
Travel times:
- Auckland to Hamilton
  - 90 minutes with stage two
  - 70 minutes with stage three
- Auckland to Tauranga
  - 2.30 hours with stage two
  - 2 hours with stage three
- Auckland to Papakura with the EMUs
  - 53 minutes pre City Rail Link

Regional Rail and population. Source: Greater Auckland

[Image: https://voaki.files.wordpress.com/2017/08/network-over-population-density-01.png]
31/08/2018  Urban Geography. The Ultimate Expression in Inter Regional Spatial Planning. Developments and Behaviours – Taking Southern…

- 43 minutes past City Rail Line
- Auckland to Hamilton by car
  - 90 minutes
  - 60 minutes from Papakura
  - 70 minutes from Manukau

Note: Auckland – Britomart Station or Hobson Street On-ramp

It should also be noted the car travel times will get longer as population and traffic increases on the Southern Motorway and Waikato Expressway.

I am not here to go over Greater Auckland’s time and dollar figures as they have done that extensively over at their place. Here I am going to look at the Urban Geography of the Regional Rapid Rail and how it promotes connectivity across the upper North Island.

![Urban Geography](https://vbird.files.wordpress.com/2017/02/urban-geography.png)

https://www.slideshare.net/lwoolberg/cities-11-urban-geography-111

The Urban Geography of the Regional Rapid Rail and how it promotes connectivity across the upper North Island

Over the years I have blogged and presented materials on inter-regional planning (and how authorities don’t quite get it). The central themes around this inter-regional planning are the following:

1. Most urban growth both residential and industrial will be in Southern Auckland
2. Industry is decamping from the Southdown–Onehunga complex and moving into Southern Auckland as land use competition with residential and commercial heats up on the Auckland Isthmus

3. Heavy industry seeks out lower land values with good connections and little land-use competition as mentioned above.
4. Population is spilling out of Southern Auckland and like industry will see provincial places in the northern Waikato.
5. State Highways 1, 2, 27 and 29 form the road spines while the North Island Main Trunk Line and the East Coast Main Trunk Line form the rail spines between Auckland, Hamilton and Tauranga.
6. The Golden Triangle forms 50% of the national population and 50-60% of national GDP.
7. Role of Manukau City Centre into the future

As Auckland continues to boom satellite towns like Pokeno, Huntly and Morrinsville will reestablish themselves especially as the other major centres (Hamilton and Tauranga) continue to become major satellites to Auckland. The good thing is those places are on both established road and rail links making their connectivity back to Auckland rather straightforward. Cue the Regional Rapid Rail concept linking the smaller and larger satellites back up to Auckland.

Population load spreading – saving the Provinces and Auckland at the same time

Rapid urbanisation has seen provincial centres without decent industry hollow out while the main urban centres continue boom and expand. This is not healthy for either and can create imbalances both economic and social that impair the economy. Whether industry moves to the provincial centres or not population load spreading (that is Auckland loses some of it population to its Satellites in the south) can act as a control rod to the reactors that are our major urban centres. As noted it above Auckland to Hamilton would be 70 minutes so being in a provincial satellite between Pokeno to Te Rapa connected to the Regional Rapid Rail allows for some Aucklanders to move while still having good connectivity with their employment back in the City. If Manukau City Centre and its big industrial complexes step up then a commute from Huntly to Pukinui or Manukau becomes even shorter.

If a smaller satellite is not for you then Hamilton or even Tauranga is always available for you to live while being connected back to Auckland via the rail system.

So yes Regional Rapid Rail connecting up both the main urban centres and the provincial satellites can give pressure relief to Auckland through population spreading.

Employment and Industry spreading

Like with population rapid urbanisation consolidated heavy industry away from small towns and into the big urban centres gutting those smaller towns. Projects like the Waikato Expressway will bypass and further harm these towns (like Huntly) so enter rail to turn things around.

Remember:

- **Assist the creation of affordable housing supply** that is well-connected by congestion-free transit. Use transit-focused residential development to catalyse the local economies of northern Waikato towns, which face potential economic decline by being bypassed by the new Waikato Expressway.

...  

Source: Greater Auckland

Heavy industry as Auckland continues to expand will seek out places where land-use competition is not intense. Smaller provincial centres connected up by decent passenger and freight rail would be in the box seat to receive these industries as they move around. But it is not only big industry on the move. As the population load spread ramps up niche industries and commerce will follow and set themselves up in the provincial centres connected by Regional Rapid Rail. This has two positive consequences:

1. Smaller urban centres increase their local employment base
2. Diversified employment base better protects the smaller centres from the fluctuations of the economy

Niche industries can include tourism which is next up.

Tourism

Two hours to Tauranga by train. I will certainly take that on a Friday evening returning to Auckland late Sunday or early Monday when taking a weekend away from Auckland compared to the two and a half hour drive by car I will have to do next month by car. Play the cards right and you could have a premium service going down on Friday and returning Sunday that serves food and well booze for a slightly higher fare. This would tap into the large tourism potential Tauranga offers but the smaller Centres connected by Regional Rapid Rail need not miss out. Rotorua, Cambridge, Waitomo and even Huntly should be able to tap into niche tourism offerings of various sizes that the rail system would allow.

Again diversifying your employment base gives you as a smaller centre better protections from the swings of the economy.

Productivity and environmental impacts – transforming and unlocking places!

Heavy Rail is the most efficient form of moving people and goods over long distances compared to road travel. Whether it be lower emissions, able to do work on your laptop, relax on the trip or simply beat congestion on the Southern Motorway productivity and (lesser) environmental impacts are winners from Regional Rapid Rail. Of course lowering the road toll (which costs the economy dearly) is another outcome of providing rail alternatives whether freight or passenger.

A rail corridor also has less environmental severance than a four lane highway does as well as less scarring. So not only does rail promote productivity and encourage lower emissions while travelling, rail also is less visually destructive to the rural environment than a four lane highway.

But the impact that might not be realised as quickly is the transformation and unlocking of potential for the Centres connected to Regional Rapid Rail network.

Being able to connect up to the large residential, employment and industrial base in Southern Auckland (let alone the rest of Auckland) opens up both the larger and smaller urban centres connected to the Regional Rapid Rail Network to opportunities not currently available. No matter what niche a provincial Centre takes up being able to be connected to a large population, employment and/or industrial base would allow those Centres to unlock their full potential and transform themselves through:

- Linking regional transportation to well-planned communities with good urban outcomes. This should not just be a rapid train network but the means to create vibrant, livable towns and cities that are economically and socially sustainable.

Vibrant places are productive and environmentally positive places.

[Remember the GPS]:

**Inviting public spaces**

71. Creating spaces within the streetscape that are attractive and safe for people to sit, gather and walk and cycle supports the objectives of creating a safer and more accessible network, as well as key outcomes around improving health and well-being.

72. Well designed, attractive public spaces provide residents with places to gather, and attract people to frequent local businesses, connect with their neighbours and partake in recreational and cultural activities.

73. GPS 2018 will support investments that make streets more inviting places for people. This should encourage more housing development in these areas and more city living.

Source: Draft GPS


Using Transport to create public spaces. Source: GPS via NZ Government

Theme: Integrating land use and transport planning and delivery

162. Integrating land use and transport planning and delivery is an important element in creating a transport network that benefits the wider community. Transport is an enabler, connector and driver of urban areas.

163. Land use planning (including planning new and increased residential or commercial development, improved health or education infrastructure or regional development) has a significant impact on transport policy, infrastructure and services provision, and vice versa. Once development has happened, its impacts on transport are long term. Changes in land use can affect the demand for travel, creating both pressures and opportunities for investment in transport infrastructure and services, or for demand management. Likewise, changes in transport can affect land use.

164. It is essential that land use and transport planning and delivery are coordinated and integrated. This is largely a role for local and central government, supported by funding under GPS 2018.

165. Central government has a role in improving the visibility of planning and infrastructure intentions, facilitating engagement and enabling joint funding and decision-making.


Integrated Land use/Transport Planning in the GPS. Source: NZ Government

The Southern Airport Line, Puhinui Station and Auckland International Airport

Auckland International Airport is the gateway to the world in terms of air travel. Currently the only way to get there is to drive or catch a regional link flight which are not cheap at the best of days. Enter The Southern Airport Line and Puhinui Station.

The Southern Airport Line is a rapid transit link (most likely light rail) from Manukau to the Airport via Puhinui Station that connects up with both the commuter rail/bus services and the Regional Rapid Rail lines. This means you could catch a train from the Waikato or Tauranga up to Puhinui Station, transfer to the Southern Airport Line at Puhinui and continue on a second train to the Airport without the hassle of driving or arranging van shuttles (subsequently risking fouling of any of the State Highways on the way to the Airport). Like wise you or tourists can do the same in return by catching the Southern Airport Line to Puhinui then catching a regional rail service down to your destination without having to worry about shuttle vans and rentals (until you get to your destination if so inclined). A good option especially if coming off a long flight.

Of course this would mean Puhinui Station would need to double in size to four platforms while both the Third and Fourth Mains would also need to be built to facilitate the high volume of freight and passenger traffic in the area.

The good news is The Southern Airport Line is already committed to and should be open by 2020. The Third Main from Westfield to Papakura is also committed to while the Fourth Main from Otahuhu to Wiri is being lobbied on to make it happen.

Regional Rapid Rail and The Southern Airport Line: seamless travel to and from the Airport no matter where you are in the upper North Island.
Item 5.3

Speaking of The Southern Airport Line

Regional Rail, The Southern Airport Line and Manukau City Centre

This next bit of urban geography doesn’t immediately stand out but it is a crucial one. This one links to the RRR’s first principle of:

- Connect major employment and population centres, including central business districts, growing metropolitan areas, employment areas and satellite towns in the Upper North Island.

Source: Greater Auckland

Major employment centre: Manukau City Centre and its industrial complexes that generation 20% of Auckland’s GDP or 7.4% of national GDP (the main City Centre also generates the same as a comparison)

Major population centre: All of Southern Auckland as it currently houses 39% of Auckland’s population and due to hit 45% in 2040

Benefit: Both connected by the rail line and State Highway One into the Waikato and Bay of Plenty

2.0 CONTEXT

Manukau is Auckland’s main industrial hub, with a metropolitan centre catering to the south Auckland market of almost half a million residents. In 2015 Manukau contributed $16 billion to the economy or about 20 per cent of Auckland’s GDP.

Although declining in importance, manufacturing remains Manukau’s largest industry sector, with transport, postal and warehousing; wholesale trade; and healthcare and social assistance sectors emerging in recent years. Its large metropolitan centre continues to serve these industries and the wider community.

Manukau’s metropolitan centre has a large Westfield shopping centre, a large district court and police station, many Council facilities, and commercial and industrial businesses in and around the centre. Together they employ around 17,000 workers on a daily basis. Two major tertiary institutions, Manukau Institute of Technology (MIT) and Auckland University of Technology (AUT), have opened new campuses here, which will attract about 10,000 students when complete in 2017.

Now let me get this perfectly clear: the main City Centre has its place and will be the nexus of commercial and civic activity for both Auckland and New Zealand. That said it does not dismiss the role of a smaller and secondary City Centre surrounded by industrial complexes in filling a need for the Waikato and Bay of Plenty.

Let’s take a look at how Panuku Development Auckland sees Manukau and its relationship with the Waikato and Bay of Plenty:

Note the Golden Triangle mentioned with Manukau acting as the key gateway.
As you can see Manukau does act as a gateway to the Waikato and Bay of Plenty. Regional Rapid Rail, and the Southern Airport Line (both to the Airport and Manukau) connect the Waikato and Bay of Plenty to both major employment and population centres. If the main City Centre is not for you or you need an industrial base Manukau and Southern Auckland has probably what you are looking for.

If Regional Rapid Rail gives you 1:10 hours from Hamilton to Britomart (City Centre) and 200 hours from Tauranga to Auckland then these are the estimate times to Manukau or the Airport via the Southern Airport Line including a maximum five-minute transfer window:

- Hamilton to Manukau or the Airport: 1 hour
- Tauranga to Manukau or the Airport: 1:40 hours

Effectively Manukau becomes the core to both Southern Auckland and the those in reach of the Regional Rapid Rail.

My Ideal central Urban Development Authority (https://voaki.net/2013/03/19/my-ideal-central-urban-development-authority/)

My Ideal central Urban Development Authority

Written by Ben Ross – Telling Auckland

Best we have towards a full-blown Planning Ministry

It has been known before and post-election that the (current) Minister of Transport, Housing and Urban Development (THUD) Phil Twyford wants urban development to move much faster than it has in the past. While urban development is accelerating in Auckland since the Unitary Plan in November 2016 there is still a role for the State to play in investment into public projects that “guide” other projects as well a provide projects that the market would not otherwise do (emergency housing being an example). However, our urban development coordination between Cities and even Regions lack despite inter-regional commuting becoming more often while freight will always move inter-regionally.

In New South Wales (and other Australian States) the State Governments will often have a Department of Environment and Planning (or some derivative) that coordinates Planning and even embark on building projects across all the Councils within the State. This Department is often known as a Planning Ministry (and over seen by a Planning Minister) and they can have quite wide ranging powers in what they can get up to. For more with NSW see http://www.planning.nsw.gov.au/ (http://www.planning.nsw.gov.au/)

The question is can it be done in New Zealand?

This from my earlier piece on a full-blown Planning Ministry in New Zealand:

The Planning (Super) Ministry and the NZIA. What Are They?

Cue the Planning Ministry and the New Zealand Infrastructure Agency

First the Planning Ministry

Formally it would be known as the Ministry of Planning and the Environment and it would have four major departments.

- The Geography Department as the overall watchdog, enforcer and coordinator when two or more of the departments are involved
- The Department of the Environment to handle the Resource Management Act (which is meant to manage the effects on the Natural Environment)
- The Department of the Urban/Built Environment and Building to handle a new Urban/Building and Building Environment Act (managing the urban environment and also absorbing the Building Act)
- New Zealand Infrastructure Agency (chief agency overseeing and investor of roads, rail tracks and sea ports)

Transport functions like licensing, Road User Charges and registrations remain with NZTA and the Ministry of Transport.

Existing functions on handling the effects of the natural environment outside of an urban centre/limits would remain with the Resource Management Act and the new Department of the Environment. All urban matters including water and air inside an urban area would shift to the new Department of Urban/Built Environment and Building division including the Auckland Unitary Plan and the Auckland (Spatial) Plan. The NZTA handles the investment and maintenance of the State Highways and the heavy rail network while also sharing costs on intra-regional schemes like bus-ways and light rail. NZTA would continue providing CPEX subsidies to things like the busses and passenger trains.

The Geography Department is the overall watchdog, enforcer and coordinator of the entire Ministry:

- Watchdog: To oversee the other Departments making sure they are delivering per policy requirements
- Enforcer: Pretty much the butt kicker if the Departments are slacking off from policy requirements. They can also bring about prosecutions if other entities or persons break the laws set about for or by the respective Departments
- Coordinator: when a major inter-regional planning and development exercise is undertaken spanning multiple entities across multiple jurisdictions and agencies the Geography Department is the one that sits on top of everything making sure the planning and delivery of the projects occur. Its watchdog and enforcer functions can apply if things go sideways

The New Zealand Infrastructure Agency oversees the roads, tracks and governance of the ports. It has full access to the National Land Transport Fund which can be used to build said roads and tracks (note: track access fees would contribute to the NLTF just as road user charges and fuel taxes do from roads).
Examples of the agencies working:

Auckland Plan or the Unitary Plan

Given both are planning exercises handling both rural and urban areas the Department of Urban/Built Environment and Building has the main call with collaboration from the Department of the Environment for issues outside the Rural Urban Boundary.

Southern Motorway upgrades or building of the Third and Fourth Mains

NZIA would handle this these projects after the request had been peer-reviewed from the Geography Department (making sure the projects complied with sound economic, social and environmental analysis) acting in its Watchdog role.

[Image: Third Main in Action at Otahuhu-Middlemore](https://va.nl/files.wordpress.com/2017/06/third-main-in-action.jpg)

City Rail Link, Congestion Free Network 2.0 (including The Southern Airport Line), and/or Regional Rapid Rail

This is where the full power of the Planning Ministry is invoked. As I said above the Ministry of Transport would normally handle this but given the place and plan making opportunities from each of these mega projects we are going to need more than MoT. Enter the Planning Ministry and its four departments.

While the NZIA would be the main executor of building these critical infrastructure links both the Departments of the Environment and Urban/Built Environment and Building also come into play as well.

Why?

Because if we followed proper integrated land use/transport goals place making (both urban and natural) present themselves as opportunities. On the natural environment side even rail lines disrupt the environment (although not as much as roads). Storm water and run off catchments are still needed in the rural areas with rail especially if wetlands...
31/08/2016  

Urban Geography: The Ultimate Expression in Inter-Regional Spatial Planning: Developments and Behaviours – Taking Southern ... are crossed or depots are built outside the urban areas. On the urban environment side is where things get very interesting very fast.

All three mega transport projects will have stations and depots (including the provincial towns in regards to Regional Rapid Rail) and this means Transit Orientated Developments.

With TODs you draw two circles using the station as the centre point. The first circle has a radius of 800 metres and this is where the highest density developments (including civic spaces) would go. Your next circle is drawn with a two kilometric radius from the station and between the 800m and 2km circles is where your medium density (relative to the town) developments (including civic spaces) would go. 800 metres is your walk up catchment to a station while two kilometres is your e-bike catchment. Both catchments would be mixed use residential and commercial developments although the 2km radius does work for industry when a freight depot is concerned (saving truck shuttling between factory/warehouse to freight station). As this is all plan and place making this is where the Department of the Urban/Built Environment and Building comes in as it can reach over boundaries Councils can not.

As multiple Councils, Ministries and Departments involved in a project as extensive as Regional Rapid Rail the Geography Department of the Planning Ministry comes into the play as the main overseer and coordinator. The Geography Department would draw up an Inter-Regional Spatial Plan as the main overarching document guiding the infrastructure and urban developments as well as natural environment stewardship much like the Auckland (Spatial) Plan does. With that spatial plan in place the respective Planning Authorities can undertake their local developments with help and coordination from the Planning Ministry (as a whole). The ultimate goal being planning, development and management is done at a coordinated whole-scale approach across multiple regions rather than the piece-meal approach that we have now (and has bogged down Hamilton to Auckland inter city rail).
Rapid Regional Rail
Source: Auckland Transport
In conclusion a Planning Ministry with its four departments including a New Zealand Infrastructure Agency would go some way to coordinate and enforce inter-regional planning that New Zealand struggles with. Our different regions have not benefited from competing with each other and should collaborate with the help of the Government via this Ministry. Each of the four departments deals with specific intricacies of planning and the different environments with the Geography Department as the overarching authority and enforcer.


We know there is no major reforms that would merge Environment with home and transport building - yet. However, the above four departments I recommended can be easily adapted to Twyford’s Transport, Housing and Urban Development portfolio.

Already the draft Government Policy Statements 1.0 and 2.0 indicates the refocusing of the Ministry of Transport, NZTA and the National (Land) Transport Fund in supporting capital investment in rail, light rail and eventually coastal shipping. The draft GPS has these four outlines:

1. Safety
2. Value for Money
3. Low Carbon (now Environment)
4. Access

With this in mind from the Government Policy Statement and the upcoming GPS on coastal shipping we essentially get an Infrastructure agency by default in all but name that delivers all modes of transport investment in New Zealand not just more and only more roads. Note: there will be overlap with Minister of Infrastructure Shane Jones’s Ministry and Twyford’s Transport portfolio.

I believe the inter city buses load up on this side

The Urban Development Authority

31/08/2018  Urban Geography: The Ultimate Expression in Inter-Regional Spatial Planning, Developments and Behaviours – Taking Southern …

Minister Twyford has made it publicly known that he wants a centralised Urban Development Authority that would be the one stop shop in planning, hearings/submissions and delivery of major urban projects not only in Auckland but right across the country. This centralised UDA would also have satellites that would be on the front line to where major urban developments were to happen. Manukau would be a good choice for a satellite UDA (that also has Council’s own UDA – Panuku in the same office) given Southern Auckland’s large scale urban development getting underway. The centralised Urban Development Authority and its satellites were first picked up here Briefing to Incoming Ministers: How to Deliver Kiwi Build (https://voacl.net/2017/12/15/briefing-to-incoming-ministers-how-to-deliver-kiwi-build)

The UDA would/should be incorporating:

- **Geography Department** as the overall watchdog, enforcer and coordinator when two or more of the departments are involved
- **Department of the Urban/Built Environment and Building** to handle a new Urban/Building and Building Environment Act (managing the urban environment and also absorbing the Building Act)

There are two changes in play owing to Housing being in the mix while Environment is still separated and handled by a different Minister (Parker). Housing – specifically the building of housing would fall under the Urban/Built Environment and Building department while the maintenance of housing, emergency housing, and tenants would still be handled as now as a separate entity. With Environment still separated District and Regional Plans (aka the Unitary Plan and the Resource Management Act for which the Unitary Plan sits under) can not be handled directly as I would like under a super Planning Ministry. While compulsion powers would be available to allow physical builds the powers to push through Public Plan Changes (e.g to change the Future Urban Zone to a live urban zone) would not be easily available potentially stalling stage 1 (Urban Geography (https://voacl.net/2018/02/12/more-chit-chat-another-housing-taskforce-gathers-to-solve-aucklands-housing-crisis/) of any large-scale urban development project (Greenfield or Brownfield) and putting an already strained Council under further strain to get these PPC’s through. If Stage 1 (also stages 2 and 3 – Regulatory, Finance and Infrastructure (https://voacl.net/2018/02/12/more-chit-chat-another-housing-taskforce-gathers-to-solve-aucklands-housing-crisis/) falls over from go (and we are seeing this today Big plan for 23,200 new homes in Auckland making slow progress (http://www.nzherald.co.nz/business/news/article.cfm?c_id=3&objectid=12015249)) then development stalls and we have a problem (yes I am rather polite here).

The fix the problems showing up in Stages 1-3 our Minister of THUD would need to allow the UDA to have the capacity to initiate and self-fund Public Plan Changes (that are still consistent with the Unitary Plan) if at least for nothing else relieve pressure on an already strained Council.

Urban Development Authority and Inter-Regional Spatial Planning

The theme of inter-regional spatial planning (an Auckland Plan on steroids) is a theme I have been running since the Unitary Plan first came out for feedback in 2013 and Manukau City Centre evolved in a Super Metropolitan Centre with an inter-regional catchment rather than sub regional catchment. The theme continues as Twyford (and others) look outside of Auckland and Wellington to both relieve pressure on both cities while also kick starting Provincial growth after the provinces have been hollowed out for so and too long.

The case of the “City Rail Link, Congestion Free Network 2.0 (including The Southern Airport Line), and/or Regional Rapid Rail” as mentioned in the Planning Ministry extract above would still continue through into the centralised Urban Development Authority given transport and land use are inter-connected (yes I know New Zealand often treats both as silos).
31/08/2018 Urban Geography: The Ultimate Expression in Inter Regional Spatial Planning, Developments and Behaviours – Taking Southern...

This is where a Geography Department would come in and be at it optimum utilisation within the UDA:

As multiple Councils, Ministries and Departments involved in a project as extensive as Regional Rapid Rail the Geography Department of the Planning Ministry comes into the play as the main overseer and coordinator. The Geography Department would draw up a an Inter-Regional Spatial Plan as the main overarching document guiding the infrastructure and urban developments as well as natural environment stewardship much like the Auckland (Spatial) Plan does. With that spatial plan in place the respective Planning Authorities can undertake their local developments with help and coordination from the Planning Ministry (as a whole). The ultimate goal being planning, development and management is done at a coordinated whole-scale approach across multiple regions rather than the piece-meal approach that we have now (and has bogged down Hamilton to Auckland inter city rail).

quote context: http://pllaq.it/778mew (http://pllaq.it/778mew)

Take out the term Planning Ministry and replace it with Urban Development Authority (that reports to the Minister of THUD anyway) and you get:

“As multiple Councils, Ministries and Departments involved in a project as extensive as Regional Rapid Rail the Geography Department of the Urban Development Authority comes into the play as the main overseer and coordinator. The Geography Department would draw up a an Inter-Regional Spatial Plan as the main overarching document guiding....”

If wider coordination is needed beyond the UDA and into the full THUD portfolios themselves then the Geography Department would also exist right up at the top at Ministry level (as well as UDA level).
In conclusion – what would I like to see with this new centralised Urban Development Authority?

Transport is being handled through the new Government Policy Statements 1.0 and 2.0 so a tick there.

Environment unfortunately is still separated meaning the UDA could struggle with any changes needed to the Resource Management Act and the Unitary Plan (which sits under the RMA) meaning we could see trip ups at Stage 1 before a project even got off the ground.

Acquisition powers and physical development (so Built-Urban Environment and Building) are touted to be allowed with the UDA while spatial planning especially inter-regional spatial planning (so a Geography Department) is an absolute must!


..................

Flew I think we have made through a large essay on what is ultimately Urban Geography – the discipline of spatial developments of towns and cities, the variations between and within those cities. Urban Geography as I see it is the ultimate expression of spatial development, urban form and using both to either influence human behaviours OR human behaviours influencing the urban form.

How we handle urban geography in New Zealand is yet to be seen. But I am excited for its future – and not just because I am an Urban Geographer....

![Tilt Train](https://voakl.files.wordpress.com/2017/08/tl-r-t-l-p.jpg)

Tilt Train
Source: Greater Auckland

Hamilton to Auckland Corridor Plan
Project scope

- Central government initiative
- The purposes are to:
  i. develop an integrated spatial plan, and
  ii. establish an ongoing growth management partnership between central government, local government and iwi.
Project partners

- NZ Government
- Waikato Regional Council
- Hamilton City Council
- Waikato District Council
- Auckland Council
- Waipa District Council
- Waikato Tainui
- Ngāti Paoa
- Hauraki Collective
- Other iwi, to be determined
Project objectives

Support growth and connectivity that realises social, economic, cultural and environmental potential by...

- Improving housing affordability and choices
- Enhancing natural and built environments and the vitality of Auckland and Hamilton and the communities within the corridor
- Improving access to employment, public services and amenities
- Creating employment opportunities in the corridor
Strategic messages from workshop

- Alignment with existing strategic documents, i.e. Auckland Plan 2050, Waikato Future Proof – cross-boundary cooperation required
- Variety of different growth scenarios for each settlement, with potential for increased scale and pace at certain locations
- Growth depends on the timing of investments in social and network infrastructure
- Strong rapid transit connections required
- Significant natural constraints to urban growth along the corridor
- Opportunities for new funding, financing and planning tools
- Continued growth management partnership needed
Key milestones and next steps

- **25 June 2018**: Terms of Reference – political representatives
- **27 – 29 August 2018**: Workshop to develop draft spatial plan
- **September 2018**: Refine and further test with local boards and key stakeholders
- **19 October 2018**: Proposed spatial plan (Deliverable 1) – political representatives
- **14 December 2018**: Partnership design (Deliverable 2) and transformative projects (Deliverable 3) – political representatives
The Hamilton-Auckland corridor partnership

*Terms of Reference*

Agreed between the Partners in Wellington on 25 June 2018
### Important caveat

*Please note that we are still to complete the partnership interest discussions with all Iwi in Tamaki-Makaurau and Hauraki, and these terms of reference are ‘near final’ subject to the views of Iwi who may still join as partners.*

### Contents

1. Parties  
2. Project scope  
3. Project objectives  
4. Approach  
5. Deliverables, process and timeline  
6. Project resource plan  
7. External advice, stakeholder engagement – and possible consultation, if required  
8. Interdependencies.
1. Parties to the Partnership

This Terms of Reference records the intention and understanding of the Parties for this project and agrees its governance arrangements. This project both reflects and forms part of an enhanced partnership between local government, central government, and iwi.

<table>
<thead>
<tr>
<th>Partners</th>
</tr>
</thead>
<tbody>
<tr>
<td>Waipa District Council</td>
</tr>
<tr>
<td>Waikato Tainui</td>
</tr>
<tr>
<td>Ngati Pāo a Haui</td>
</tr>
</tbody>
</table>

Governance of the Project

Ministers, Mayors, Chairs, and Councillors representing the Partners will meet as required to consider the project’s progress and deliverables. In addition to other aspects of the wider partnership, a senior level steering group consisting of nominated officials will be responsible for delivering the project in line with the agreed terms of reference.
2. Project Scope

The dual purpose of the project is to (1) develop an integrated spatial plan and (2) establish an ongoing growth management partnership for the transport corridor between Hamilton and Auckland (as defined on the right) which:

1. Accelerates identified transformational opportunities.
2. Outlines key housing, employment, social, environmental and network infrastructure priorities for the corridor over the next 30 years to successfully accommodate growth and also address levels of service, remedial or renewal needs.
3. Identifies planning, development, infrastructure, mitigation and restoration works required, and funding and legislative projects partners may take over the next 1-3, 3-10 and 10-30 years.

This initiative will contribute and complement other relevant economic, social, cultural and environmental initiatives and programmes.
3. Project Objectives

To better support growth and increase connectivity within the Auckland to Hamilton corridor, in a way that realises its social, economic, cultural and environmental potential by...

1. Improving housing affordability and choices
2. Enhancing the quality of the natural and built environments and the vitality of Auckland and Hamilton and the communities within the corridor
3. Improving access to employment, public services and amenities.
4. Creating employment opportunities in the corridor

Underpinned by these principles...

The agreed corridor plan will:

- Create a platform for the future that will change lives
- Make efficient use of existing infrastructure and future infrastructure funding, design and delivery.
- Protect high quality soils for growing food
- Contribute to the restoration and protection of the Waikato and Waipā Rivers and indigenous biodiversity within the corridor
- Anticipate the transition to a low-carbon future, build climate resilience, and avoid increasing the impacts and residual risks of natural hazards
4. Approach

The Project will achieve its objectives by making the most of a partnership between iwi, central government and local government in the corridor between Auckland and Hamilton, which coordinates their complementary planning, tools, assets, funding and powers.

A new, different form of partnership spatial planning and growth management that is definitive yet agile and responsive.

- True joint planning and growth management between iwi, local and central government, including certainty of government support including co-investment
- Build on the strong foundation of collaboration and significant local investment in the region.
- Protection of key corridors, public open spaces and critically sensitive locations to provide the 'skeleton' for future growth
- Use of innovative new tools (e.g. Kiwibuild, Urban Development Authority, infrastructure funding/financing, PGF, transport pricing, environmental impact offsetting, legislative reform)
- A more responsive spatial planning approach that facilitates the market to deliver on desired outcomes through more competitive land markets as well as other means.

Desired settlement form

Future development in the Auckland to Hamilton corridor should:

- be transit-oriented and connected
- provide affordable choices that respond to demands, including quality intensification
- provide live-work-play settlements.
5. Deliverables, Process and Timeline

Deliverables/work streams

1. A spatial **plan** for the corridor that sets out:
   - Shared objectives, KPIs/targets
   - The key opportunities, challenges and constraints and solutions to navigate through these
   - A map and supporting statements that sets out the preferred approach to future housing, employment, environmental, social and network infrastructure development

2. Design and establishment of an ongoing growth management **partnership** that ensures:
   - Partners remain aligned with regard to the implementation of the plan, deliver agreed actions, and jointly monitor and address progress
   - Partners have the tools and ability to be more agile in responding to opportunities.
   - Partners successfully respond to new issues and opportunities as they arise
   - Future amendments are made to the plan as required.

3. An implementation/action plan with joint short, medium and long term transformative **projects**:
   - Further investigations (e.g. business case development) will be required to support future decision-making on implementation of some of the actions i.e. further analysis to support investment by the partners.

Process and Timeline

**July-August:** Completion of base information and analysis. Series of design workshops to craft corridor development options, test, re-develop, test. Engagement with stakeholder governors and selected stakeholders.

**Late August:** Governance leaders meeting to review first draft of the plan. Complements planned Waikato economic summit on 30-31 August.

**September:** Refine the plan and further test with key stakeholders; amend as required.

**Early October 2018:** Governance leaders consider proposed **plan** (Deliverable 1) and also first list of **projects** and draft **partnership** design (Deliverables 2 & 3).

**Early December 2018:** Governance leaders consider the **partnership** design and a refined list of **projects** (Deliverables 2 & 3).
### 6. Project Resource Plan

<table>
<thead>
<tr>
<th>Core Resources</th>
<th>Budget</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Planning Advisor – jointly appointed independent advisor</td>
<td>As far as possible the project will be delivered by the Partners contribution in-kind staff, material, facility and other technical support.</td>
</tr>
<tr>
<td>2. Project Coordinator – secondment from NZTA</td>
<td>The project Partners are having conversations about contributions towards a budget of that will be used to procure:</td>
</tr>
<tr>
<td>3. Communication and Engagement Advisor – resource provided by Waikato Regional Council</td>
<td>- Jointly appointed independent planning advisor</td>
</tr>
<tr>
<td>4. Specialist Planners and Advisors from</td>
<td>- Specialist advice that may not available within Partner or Associate Party organisations</td>
</tr>
<tr>
<td>1. NZTA</td>
<td>- Venue hire and catering for the purposes of plan design and stakeholder engagement, beyond what can reasonably be contributed in-kind by one of the Partners.</td>
</tr>
<tr>
<td>2. MBIE</td>
<td>The budget share of each Partner will be jointly agreed by the respective Chief Executives in June 2018.</td>
</tr>
<tr>
<td>3. Auckland Council and Auckland Transport</td>
<td></td>
</tr>
<tr>
<td>4. FutureProof Partnership (includes Waipa District)</td>
<td></td>
</tr>
<tr>
<td>5. Specialist GIS and Design support – NZTA and MBIE</td>
<td></td>
</tr>
<tr>
<td>6. Advisory and technical groups with representation from Auckland Transport, Watercare, local iwi, Treasury, DIA, TPK, DHBs, Regional Health Alliance Ministry of Education, Housing NZ, Northern. MSD and other organisations as required.</td>
<td></td>
</tr>
</tbody>
</table>
7. External advice, stakeholder engagement - and possible consultation, if required

- The project may commission external advice and peer review throughout the delivery of the project to support the recommended strategic approach, being mindful of resourcing parameters.
- In line with an agreed Stakeholder Engagement Plan, the project will engage with external stakeholders, including mana whenua, business and community groups, in a targeted manner to receive feedback as appropriate throughout the development of the joint plan.
- A decision on whether formal consultation is required on the Plan will be made by the Governance leadership based on advice from officials based on the emerging contents of the Plan and its relationships with existing policies and plans.
8. Interdependencies

Key linkages

The project has linkages to several other work streams, several of which are key to successful realisation of a corridor plan, including:

- The Urban Growth Agenda and related work programmes that include:
  - New housing options, at a range of price points, locations and types
  - Broader ranges of tools and funding mechanisms
  - Initiatives to increase the demand for intensification
  - Clear and concise built environment principles
  - Better understanding of wider costs (social, economic and environmental) and benefits in decision-making
  - Increased use of low emissions transport modes
  - Efficient management of demand across the transport network
- The Auckland and Waikato Transport Connections Strategic Business Case, and the implementation of ATAP, freight and rail reviews
- NPS on Urban Development Capacity, Waikato Means Business and others

Further partnerships elsewhere – learning from this process

The project is both an expression of - and one of the first steps in - forming stronger spatial planning partnerships between the Crown, Iwi and Councils. As such it forms part of a broader and evolving partnership programme.

While Auckland-Hamilton is a priority, there is an opportunity to further develop this approach as a partnership model for central and local government, using this Plan as a pilot. Particularly so in respect to other high growth areas, where there may be a desire to commence similar projects in the near future.

This necessitates consideration of this project within the broader local government context and exploration of opportunities to draw from this project as a basis to future engagement with other councils.
Unitary Plan Monitoring Project
Planning Committee, September 4, 2018
Monitoring the effectiveness and efficiency of the plan is required under the Resource Management Act

35 Duty to gather information, monitor, and keep records

(1) Every local authority shall gather such information, and undertake or commission such research, as is necessary to carry out effectively its functions under this Act or regulations under this Act.

(2) Every local authority shall monitor—

- (b) the efficiency and effectiveness of policies, rules, or other methods in its policy statement or its plan; and

(2A) Every local authority must, at intervals of not more than 5 years, compile and make available to the public a review of the results of its monitoring under subsection (2)(b)
The policy ‘life cycle’:

- Legislation/Policy
- Research and investigation
- Analysis of options
- Adoption of policy
- Monitoring and review
- Implementation
Draft timeline for the project:

**2017**
- Phase one: Preparation
  - Research best practice monitoring
  - Identify existing monitoring
  - Establish an overall monitoring framework
  - Draft Monitoring Strategy (internal document)

**2018**
- Phase two: Monitoring framework and evaluation
  - Complete Project Plans. Assign rolling topic areas and work-streams
  - Scope information, available data and resources
  - Develop indicators and measures
  - Evaluate efficiency & effectiveness
  - Reporting (regular)

**2019**
- Phase three: Implementation
  - Establish an on-going process
  - Report and recommendations
  - Publish results
  - Review process

**2020**

**2021**

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Item 12
2018

B2 – Urban Growth and Form (2.2 Urban Growth & Form, 2.3 Quality Built Environment, 2.4 Residential Growth, 2.5 Commercial & Industrial Growth, 2.6 Rural & Coastal Villages)

B6 – Mana Whenua (all sub-chapters)

B7 – Natural Resources (7.3 Freshwater Systems)

2019

B2 – Urban Growth and Form (2.7 Open Space & Rec, 2.8 Social Facilities)

B3 – Infrastructure, transport & energy (all sub-chapters)

B4 – Natural Heritage (all sub-chapters)

B5 – Built Heritage & Character (all sub-chapters)

2020

B7 – Natural Resources (7.4 Coastal water, freshwater & geothermal water)

B7 – Natural Resources (7.2 Indigenous biodiversity, 7.5 Air, 7.6 Minerals)

B8 – Coastal environment (all chapters)

B9 – Rural environment (9.4 – Rural subdivision)

2021

B9 – Rural environment (9.2 Rural activities, 9.3 Land with high productive potential)

B10 – Environmental risk (all chapters)