Before the Wellington City Council Proposed District Plan Hearings Panel

Under	the Resource Management Act 1991 (the Act)
In the matter of	the Wellington City Council Proposed District Plan– Hearing Stream 1: **Strategic Direction:** • **Overarching issues including Intensification Streamlined Planning Process (ISPP)/Part One Schedule 1 of the Resource Management Act 1991 (P1Sch1) split** • **Plan structure** • **Strategic direction** • **ISPP vs Pt Section 1 provisions** • **Cross-plan definitions**
Between	**Wellington City Council** Local authority
And	**Transpower New Zealand Limited** Submitter 315 and Further Submitter FS29

Statement of Evidence in Chief of Dougall Campbell for Transpower New Zealand Limited

Dated 7 February 2023

Executive Summary

1. Transpower New Zealand Limited (**Transpower**) operates the National Grid, which transmits electricity throughout New Zealand. Within Wellington City there are 13 high voltage National Grid transmission lines ranging from 33 kilovolts ("kV") to 350 kV. Eight of the lines operate at 110 kV. There are six designated substations. Transpower also has an interest in the West Wind Substation and has other facilities across the city such as communication assets. Three 500kV submarine cables across the Cook Strait, which transmit electricity between the North and South Islands (commonly known as 'The Cook Strait Cables'), connect in to the Oteranga Bay cable termination station. National Grid assets in Wellington City serve communities at local, regional and national levels.

2. While a resilient National Grid remains at the heart of New Zealand's energy future, climate change has become a central issue for governments globally and hence for Transpower as a responsible owner and operator of the National Grid on behalf of New Zealanders. In this context Transpower will play a critical role for New Zealand in meeting its zero carbon aspirations, by both investing in its existing assets and enabling connections to new sources of renewable energy.

3. The National Policy Statement on Electricity Transmission 2008 (**NPSET**) requires the National Grid to be appropriately recognised in the Proposed Wellington City District Plan (the "PDP"). The PDP must give effect to the NPSET. This means that the PDP must include provisions to:

   - recognise and provide for the national significance of the National Grid;
   - manage the effects of the National Grid; and
   - manage effects of the National Grid.

4. Transpower adopts a thorough and systematic approach to planning for and establishing new National Grid assets.

5. Transpower wishes to see appropriate planning provisions included in the PDP to ensure that Transpower is able to develop, upgrade, operate, and maintain the National Grid to enable a sustainable, secure and

reliable supply of electricity to the Wellington region and nationally. Transpower's approach to NPSET implementation will be outlined in future hearings when specific provisions are addressed.

6. Transpower considers that the amendments and additions set out in **Ms Whitney**'s evidence will best give effect to the objective and policies of the NPSET. **Ms Whitney** supports the majority of the recommendations within the s42A report but seeks some amendments (to one strategic objective and insertion of two definitions) to give effect to the NPSET, the NPS-UD and the Resource Management (Enabling Housing Supply and Other Matters) Amendment Act 202. I concur with the amendments sought in **Ms Whitney**'s evidence.

7. The provisions Transpower seeks in Wellington City are generally consistent with the provisions Transpower seeks elsewhere around New Zealand to give effect to the NPSET.

Introduction

8. My full name is Dougall James Campbell. I am the Environmental Policy and Planning Group Manager at Transpower. My relevant experience, qualifications, and commitment to comply with the code of conduct for expert witnesses are included in **Appendix A**.

9. I confirm that I am authorised to give this evidence on behalf of Transpower.

Scope of Evidence

10. My evidence will address the following:

    a) Transpower and the National Grid;

    b) New Zealand's Paris Commitment and Decarbonisation;

    c) Transpower's assets within Wellington City; and

    d) Conclusions.

Transpower and the National Grid

11. Transpower is a State-Owned Enterprise that plans, builds, maintains, owns and operates New Zealand's high voltage electricity transmission network – the National Grid. The National Grid links generators to distribution companies and major industrial users. It extends from Kaikohe in the North Island down to Tiwai in the South Island and carries electricity throughout New Zealand.

12. New Zealand has become increasingly dependent on electricity. It is an intrinsic part of living and working in the 21st century. Electricity now accounts for about 25% of all energy used in New Zealand. Each year, $5 billion worth of electricity is traded on the wholesale electricity market. Transpower, whose main role is to ensure the delivery of a reliable and secure supply of electricity to New Zealand, has a fundamental role in the industry and in New Zealand's economy.

13. Transpower is not a generator of electricity and has no retail sales of electricity. It can be considered to be a 'freight company' for electricity,

in that it carries bulk electrical energy from where it is generated to where it is used, be that by large industrial 'direct connect' customers or local electricity distribution companies – which for Wellington City, is Wellington Electricity.

14. Transpower also manages New Zealand's power system in real time. In its role as System Operator, Transpower operates the electricity market to ensure electricity transmitted through the National Grid is delivered whenever and wherever it is needed, 24 hours a day, seven days a week.

15. Transpower's main role is to ensure the reliable supply of electricity to the country. Transpower plays a significant part in New Zealand's economy, with all major industries, cities and communities being reliant on a secure and reliable supply of electricity.

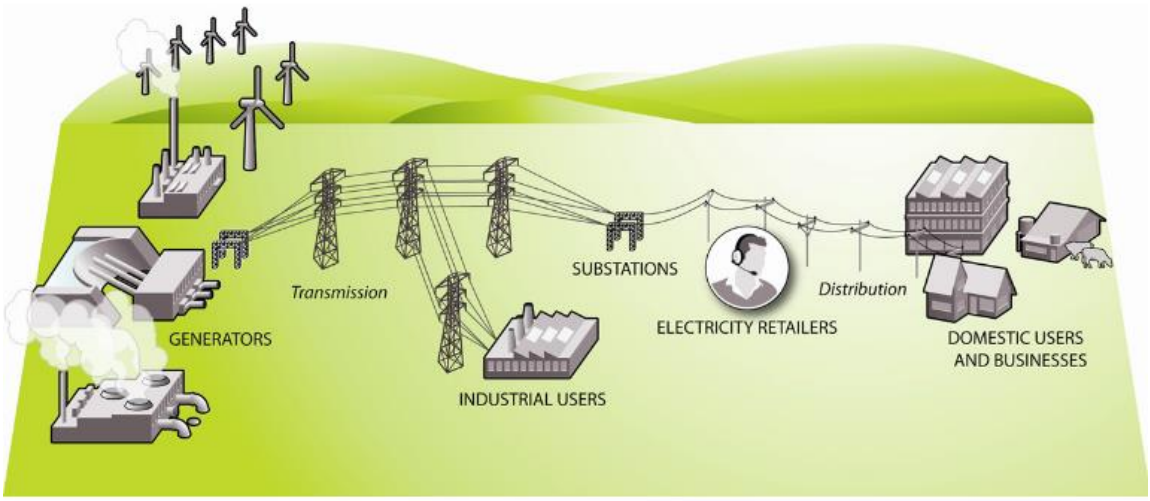


Figure 1. Electricity Industry in New Zealand. Source MBIE

16. As a State-Owned Enterprise, Transpower's principal objective is to operate as a successful business. It must operate within certain legislative constraints and report regularly to its shareholding Ministers. Transpower is required to deliver and operate a National Grid that meets the needs of users now and into the future.

17. One of Transpower's key objectives therefore is to maintain and develop the National Grid, which contributes to New Zealand's economic and social aspirations. This objective is reflected in the single objective in the NPSET, as outlined in Ms Whitney's evidence.

18. Prudent investment in the National Grid (including for maintenance), long term transmission planning strategies, and developing technologies are crucial to ensure the most can be made from existing infrastructure. This will, in turn, help to limit the cost and environmental footprint of the National Grid for future generations. This is more critical than ever in the context of the Climate Change Response (Zero Carbon) Amendment Act 2019, which I expand on later in this evidence.

The National Grid

19. The National Grid comprises some 11,000 km of transmission lines and over 170 substations across the country. This is supported by a telecommunications network of some 300 telecommunication sites, which help link together and communicate with the components that make up the National Grid.

20. The National Grid comprises a high voltage backbone which runs the length of the country and links major generation (such as the geothermal power stations near Taupō) to major loads in the main cities. The bulk of the National Grid backbone was built around 60 years ago and comprises most of the 220 kilovolt (kV) lines throughout New Zealand, along with the High Voltage Direct Current (HVDC) link between the North and South Islands.

21. Connected to this National Grid backbone are regional National Grid lines (also owned or operated by Transpower) which connect smaller generation stations and supply regional communities. A map showing National Grid substation and transmission lines within Wellington City is included in **Appendix B** to this evidence.

22. The National Grid is an interlinked network. Electricity flows along transmission lines via conductors supported by towers (pylons) or poles and can vary in any instant, depending on actual generation at power stations and the demand for electricity across New Zealand. As System Operator, in operating the electricity market, Transpower uses real-time information about electricity use by consumers and electricity generation available from generators to balance electricity demand and supply, ensuring optimum performance of the network.

25 The National Grid provides connectivity between all sources of generation and consumers. Without the National Grid, consumers across New Zealand would be dependent on locally generated electricity which would be more expensive and less reliable. As such, the National Grid plays an important role in the sustainable management of natural and physical resources.

Transmission Tomorrow

23. Transpower's 2018 publication "Transmission Tomorrow" sets out Transpower's strategy for the future development of the National Grid for the next 30 years and beyond. Transmission Tomorrow documents Transpower's view that there is an enduring role for the National Grid. Transpower's lines and substations will be required for many years into the future to power the economy while enabling New Zealand's continued reliance on renewable forms of electricity generation, including from the power stations along the Waikato River, and the new geothermal stations commissioned near Taupō.

New Zealand's Paris Commitment and Decarbonisation

24. In early 2018 Transpower published its white paper "Te Mauri Hiko – Energy Futures" (Te Mauri Hiko). This project closely examined a range of electricity supply, demand and future technology scenarios and began exploring what will be required for New Zealand to maximise the potential of the energy opportunity it is facing, including meeting its Paris Climate Accord commitments. Greenhouse gas emission reduction targets were agreed by New Zealand at the 2016 Paris Climate Accord and have been translated into climate policy via the Climate Change Response (Zero Carbon) Amendment Act 2019.

25. An updated strategy underlining the need to decarbonise New Zealand's economy, Transmission Tomorrow, was published in 2018. Transmission Tomorrow sets out how Transpower will go about planning and the developing the transmission system as demand for electricity increases as the transport and process heat sectors are electrified, and as new renewable generation is added to the system.

26. Since then, in 2020, Transpower released a further document "Whakamana i Te Mauri Hiko – Empowering our Energy Future" which sets out a blueprint for how New Zealand might get to a zero-carbon future. It is consistent with the findings of both the Interim Climate Change Committee and the Productivity Commission that the greatest opportunities for emissions reductions outside of agriculture lie in the energy sector; specifically around increasing the proportion of renewable electricity in the system and the electrification of emissions intensive transport and process heat sectors. In February 2021, Transpower published its "Electrification Roadmap". This work focuses on policy options to accelerate emissions reductions in the transport and process heat sectors.

27. While a resilient National Grid remains at the heart of New Zealand's energy future, climate change has become a central issue for governments globally and hence Transpower as a responsible owner and operator of the National Grid on behalf of New Zealanders. Technology continues to advance rapidly. Electricity is increasingly positioned as an energy source for whole economies, rather than just homes and some business processes.

28. As the economy electrifies in pursuit of the most cost efficient and renewable sources, the Whakamana i Te Mauri Hiko base case predicts that electricity demand is likely to increase around 55% by 2050. Since 2020, this demand is now expected to be 70% by 2050. Whakamana i Te Mauri Hiko suggests that meeting this projected demand will require significant and frequent investment in New Zealand's electricity generation portfolio over the coming 30 years, including new sources of resilient and reliable grid connected renewable generation. In addition, new connections and capacity increases will be required across the transmission system to support demand growth driven by the electrification of transport and process heat. Simply put, New Zealand's electricity transmission system is the infrastructure on which our zero-carbon future will be built. The pressing need for new electricity infrastructure exists now, and will continue to ramp up over the coming decades. If infrastructure delivery does not keep pace with the rapidly growing demand, New Zealand will need to continue to rely on fossil fuels

to generate electricity. And, at worst, security of supply will be compromised.

29. It is noted that developments in solar and battery technology, from grid scale down to residential installations, along with the electrification of process heat, will form much of the future tomorrow's low-carbon energy system. Transpower produced in-depth reports on all three topics as part of the programme of work leading to the 2020 publication of Whakamana i Te Mauri Hiko.

30. The transformation to a predominantly electrified economy is not theoretical - it is already happening. Transpower has experienced a surge in connection requests, including significant levels of national and international inquiry from potential generation developers interested in investing in New Zealand. While this surge was first identified in Whakamana i Te Mauri Hiko, there has been an unprecedented increase in connection enquiries – from around five per year in 2016 to more than 124 enquiries for the year ending June 2022.

31. This work supports Transpower's view that there will be an enduring role for the National Grid in the future, and the need to build new National Grid lines and substations to connect new, renewable generation sources to the electricity network.

32. In terms of a brief summary, the National Grid:

a) Transports electricity across the country (connecting generation to consumers);

b) Supports New Zealand's national and regional economic growth;

c) Plays an essential role in maintaining reliability and security of supply of energy;

d) Provides a basis for investment decisions to be made by both suppliers and consumers of electricity;

e) Enables competition among suppliers and retailers of electricity, thereby providing the basis for competitively priced electricity;

f) Assists the development of new electricity generation technologies, including renewable energy, by providing access to markets;

g) Enables the electrification of transport and process heat, without which there is no way in which our Paris Agreement and net-zero carbon economy commitments can be met; and

h) Is predicted to play a key role in the decarbonisation of the economy.

Transpower's assets within Wellington City

33. The wider Wellington region is the major load centre of the southern North Island, comprising both residential loads and a major city Central Business District (CBD). The Greater Wellington region includes the large load centre of Wellington City, together with four other cities (Hutt City, Upper Hutt City, Porirua City and Kapiti Coast District) with provincial towns and smaller rural localities.

34. It is the main corridor for through-transmission between the North and South Islands. The loading of these circuits is primarily driven by HVDC (high-voltage direct current) power flow and Central North Island generation. The HVDC link can transfer up to 850 MW to the South Island (depending on the load and generation in the Wellington region), and up to 1,200 MW from the South Island. As generation capacity in the region is much lower than local load, power is normally imported, either via the HVDC link (from the South Island) or from the Central North Island.

35. There are submarine cables across the Cook Strait, which transmit electricity between the North and South Islands (commonly known as 'The Cook Strait Cables'). These are critical infrastructure in enabling the transfer of electricity from the South and North Islands, as needed. It is likely that these will need to be expanded or extended to achieve the bare minimum requirements for future use.

36. There are six (designated) substations within Wellington City being the Central Park Substation, Kaiwharawhara Supply Point Substation, Takapu Road Substation, Wilton Substation, Te Hikowhenua Shore Electrode Station, and Oteranga Bay Terminal Station. Transpower also has an interest in the West Wind Substation and has other facilities across the city such as communication assets.

37. The following National Grid assets are within or traverse the Wellington City region.

a) Bunnythorpe - Wilton A (BPE-WIL-A) – 220kV Double Circuit on Steel Towers

b) Central Park - Wilton A (CPK-WIL-A) – 110kV Double Circuit on Steel Towers

c) Central Park - Wilton B (CPK-WIL-B) – 110kV Double Circuit on Steel Towers

d) Haywards - Takapu Road A (HAY-TKR-A) – 110kV Double Circuit on Steel Tower

e) Paekakariki - Takapu Road A (PKK-TKR-A) – 110 kV Double Circuit on Steel Towers

f) South Makara - Oteranga Bay A (SMK-OTB-A) – 11kV Single Circuit on Single Poles (including an underground portion that traverses Karori Golf Club)

g) Takapu Road - Wilton A (TKR-WIL-A) – 110kV Double Circuit on Steel Towers

h) West Wind - Tee A (WWD-TEE-A) – 110kV Double Circuit on Single Poles

i) Khandallah - Takapu Road A (KHD-TKR-A) – 33kV Double Circuit on Steel Towers

j) Kaiwharawhara - Wilton A (KWA-WIL-A) – 110kV Double Circuit Steel Tower (including an underground portion that terminates at Kaiwharawhara Substation)

k) Oteranga Bay - Haywards A (OTB-HAY-A) – 350kV Double Circuit on Steel Tower

l) Kaiwharawhara Power Cable (KWA-CBL-42) 110kV Underground Power Cable

m) Te Hikowhenua - Deviation A (THW-DEV-A) - Single Circuit Steel Towers and Pi poles

38. These assets are shown on the map in Appendix B to my evidence.

39. In terms of Transpower's projects in Wellington City, there are two current reconducting projects occurring within the City. Transpower is in the process of reconductoring part of its BPE-WIL A 220kV transmission line. This is a staged reconductoring project being carried out between Wilton substation and the Judgeford Tee. This project involves reconductoring of the line, but it is also changing from being a duplex to simplex transmission line (reducing the number of conductors). Work is currently underway this summer on the section of line spanning the Ohariu Valley region.

40. Reconductoring on the OTB-HAY A 350kV transmission line between Churton Park and Grenada North was largely completed in 2020. The last span crossing State Highway 1, the main trunk line, and Porirua Stream will be completed by the end of February 2023.

41. Other than these projects, in addition to carrying out business as usual maintenance works on its assets within Wellington (such as support structure foundation strengthening, support structure replacement (such as that occurring on towers on the PKK-TKR-A 110 kV transmission line), vegetation trimming and clearance, and access track maintenance), Transpower is undertaking various investigations across the network to improve resilience and meet expected load growth across the network.

Conclusions

42. The National Grid is critical to the social and economic wellbeing of the Wellington City region and our nation generally. It will also play a critical role in New Zealand's carbon zero commitment and mitigating the effects of climate change. This will necessitate the upgrade of existing, and construction of new, National Grid assets. As an infrastructure asset of national significance, the NPSET requires that the National Grid be recognised and provided for in the PDP.

43. Transpower's relief will ensure integrated management of activities through the District Plan to provide for sustainable development of both the National Grid infrastructure and other natural and physical resources,

both of which are critical for the future development of Wellington City and New Zealand.

Dougall Campbell
7 February 2023

Appendix A – Relevant Experience and Qualifications

1. I am the Environmental Policy and Planning Group Manager at Transpower. My Group's responsibilities include:

    a) Strategic planning. This planning is achieved through the development and implementation of Transpower's approach to the NPSET at a national level and local level.

    b) Delivering Transpower's policy approach on environmental regulations, legislation and council planning documents.

    c) Ensuring the on-going and future protection of Transpower's network.

    d) Ensuring that all environmental approvals are obtained for Transpower's physical works.

    e) Managing third party interactions to ensure that Transpower's interests are appropriately maintained.

2. I have been employed by Transpower for over 18 years, and during this time I have had experience working in various roles; including:

    a) As a Grid Programme Delivery Specialist. This role involved developing a "lessons learned" and continuous improvement strategy and process for Grid Projects.

    b) As the Environmental Planning and Stakeholder Manager on the Alliance Management Team of the Transpower Alliance. I was responsible for the environmental planning, strategy and policies, and processes to deliver and monitor all the necessary environmental approvals for the 400kV capable overhead line section of the North Island Grid Upgrade Project (NIGUP). This line traverses 185km from Whakamaru (North Taupo) to Brownhill Road (South Auckland).

    c) Carrying out stakeholder relationship responsibilities of the Transpower Alliance, ensuring that key stakeholders are informed, risks are identified, and reputations are enhanced.

    d) As a Senior Environmental Planner/Environmental Project Manager for NIGUP. My responsibilities included developing

strategy for consenting major projects, managing the environmental consortium appointed to deliver NIGUP, through to the final Notices of Requirement, managing the resource consent documentation and the Board of Inquiry process.

e) Providing planning advice to support the implementation of Transpower's Grid Vision investigations and its System Integration investigations.

3. I have a Bachelor of Regional Planning Degree and a Diploma in Business Studies from Massey University. I have over 27 years' experience working as an environmental planner and I am a member (Intermediate) of the New Zealand Planning Institute.

4. I confirm I have read the Code of Conduct for Expert Witnesses contained in the Environment Court Consolidated Practice Note 2023. As I am employed by Transpower, I acknowledge I am not independent; however, I have sought to comply with the Code of Conduct. In particular, unless I state otherwise, this evidence is within my sphere of expertise and I have not omitted to consider material facts known to me that might alter or detract from the opinions I express.

Appendix B – National Grid Assets within the Wellington City Region

Transpower Assets

Wellington City

Legend

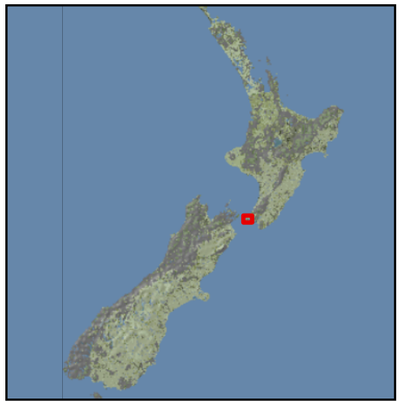
Territorial Land Authority
- Boundary

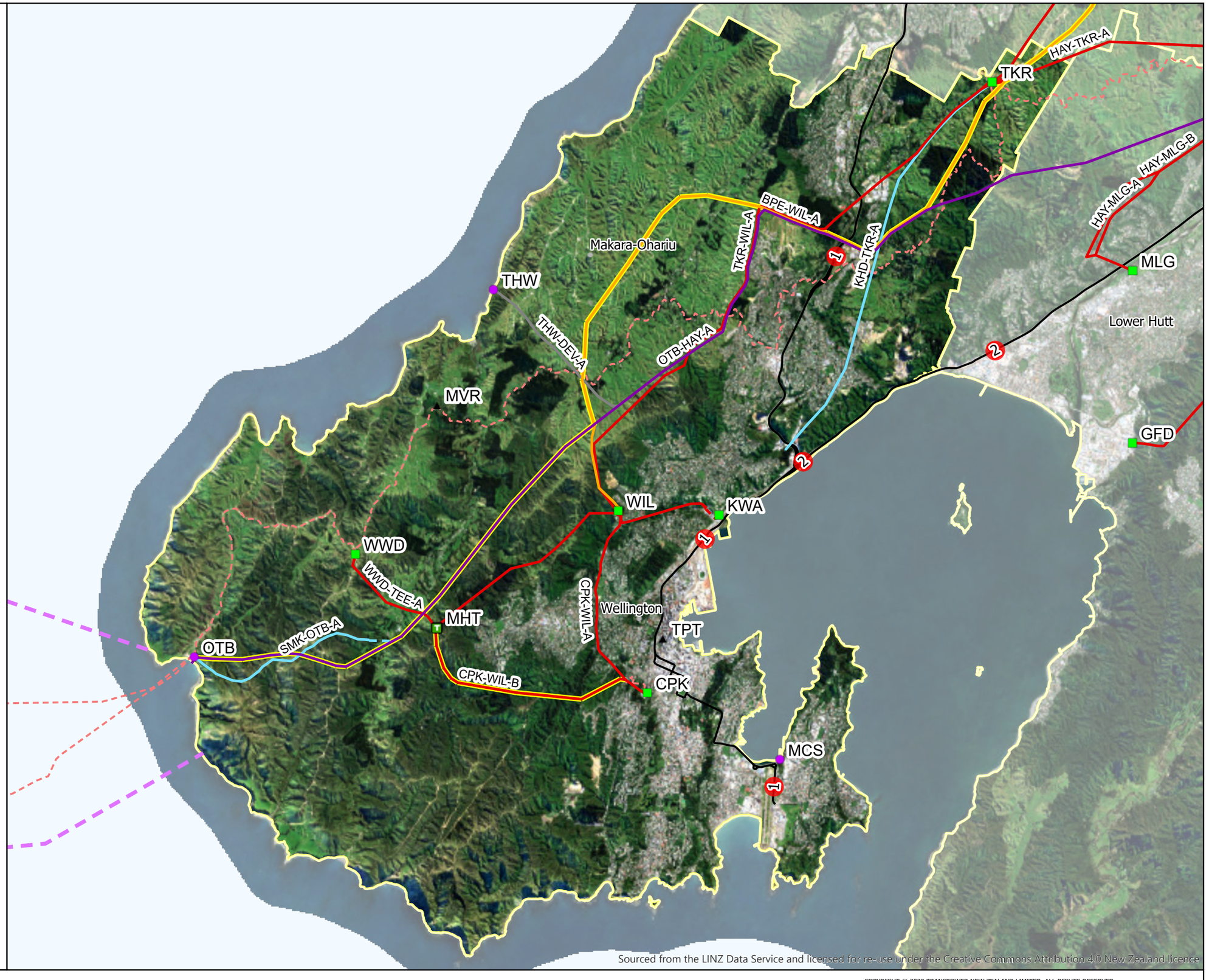
NZ Roads
- Highways

Transpower Assets
- Cable Protection Zone
- Overhead Fibre Cable
- Underground Fibre Cables

Site
- ACSTN
- COMMS
- HVDC
- TEE

Transmission Line
- 0kV Overhead
- 11, 66kV Underground
- 11, 33, 66 kV Overhead
- 110kV Underground
- 110 kV Overhead
- 220kV Underground
- 220 kV Overhead
- 350 kV Overhead
- 350kV Submarine
- 400kV Overhead





TRANSPOWER
Prepared by: Transpower Geospatial

Projection: NZTM 2000 Scale: 1:96,000 Plan Size: A3L

0 1,000 2,000 km

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Date: 8/04/2020 *Drawn by: berrymanem*

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