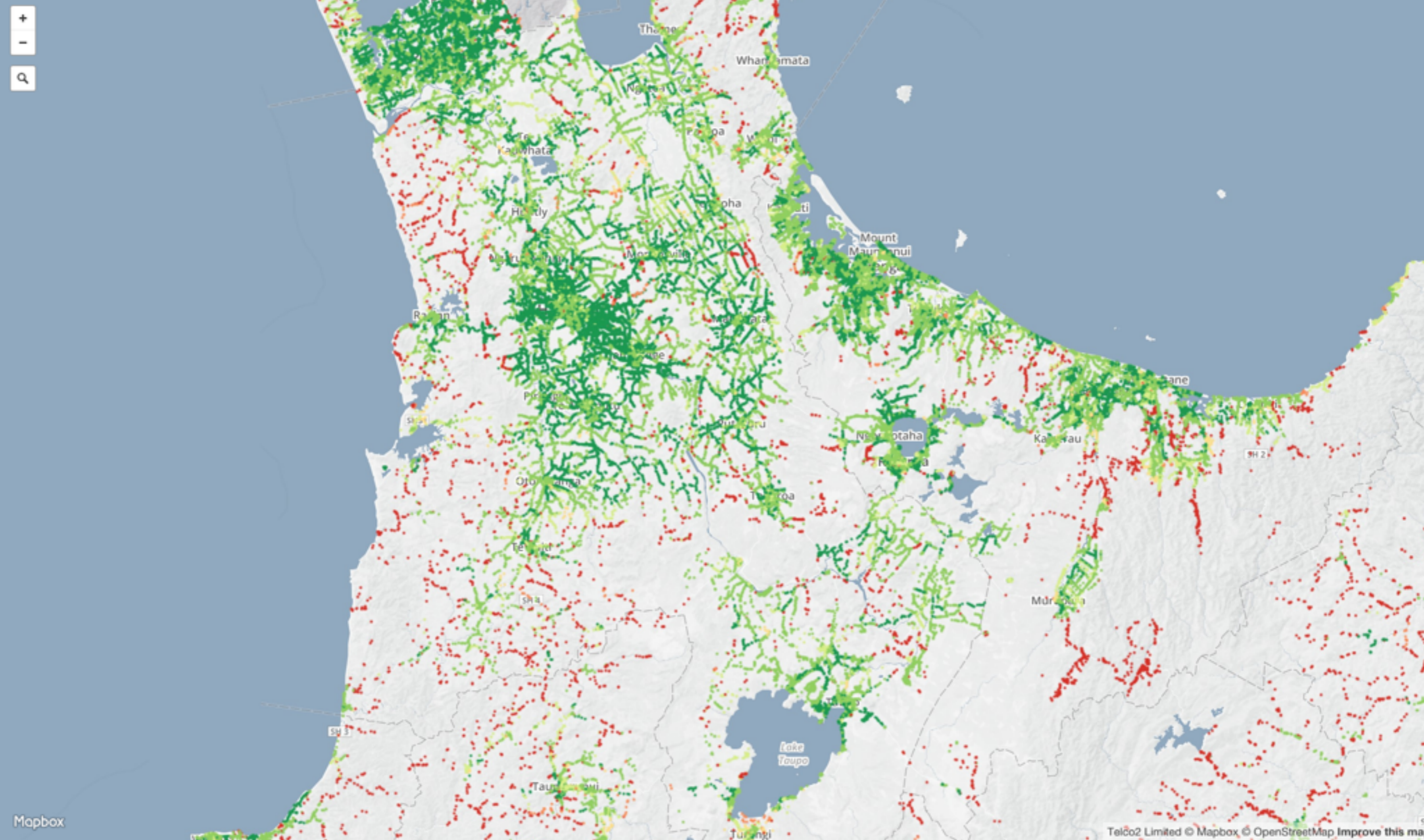


Broadband Affordability in New Zealand

A Little Big Data Project
using Broadband Coverage Data

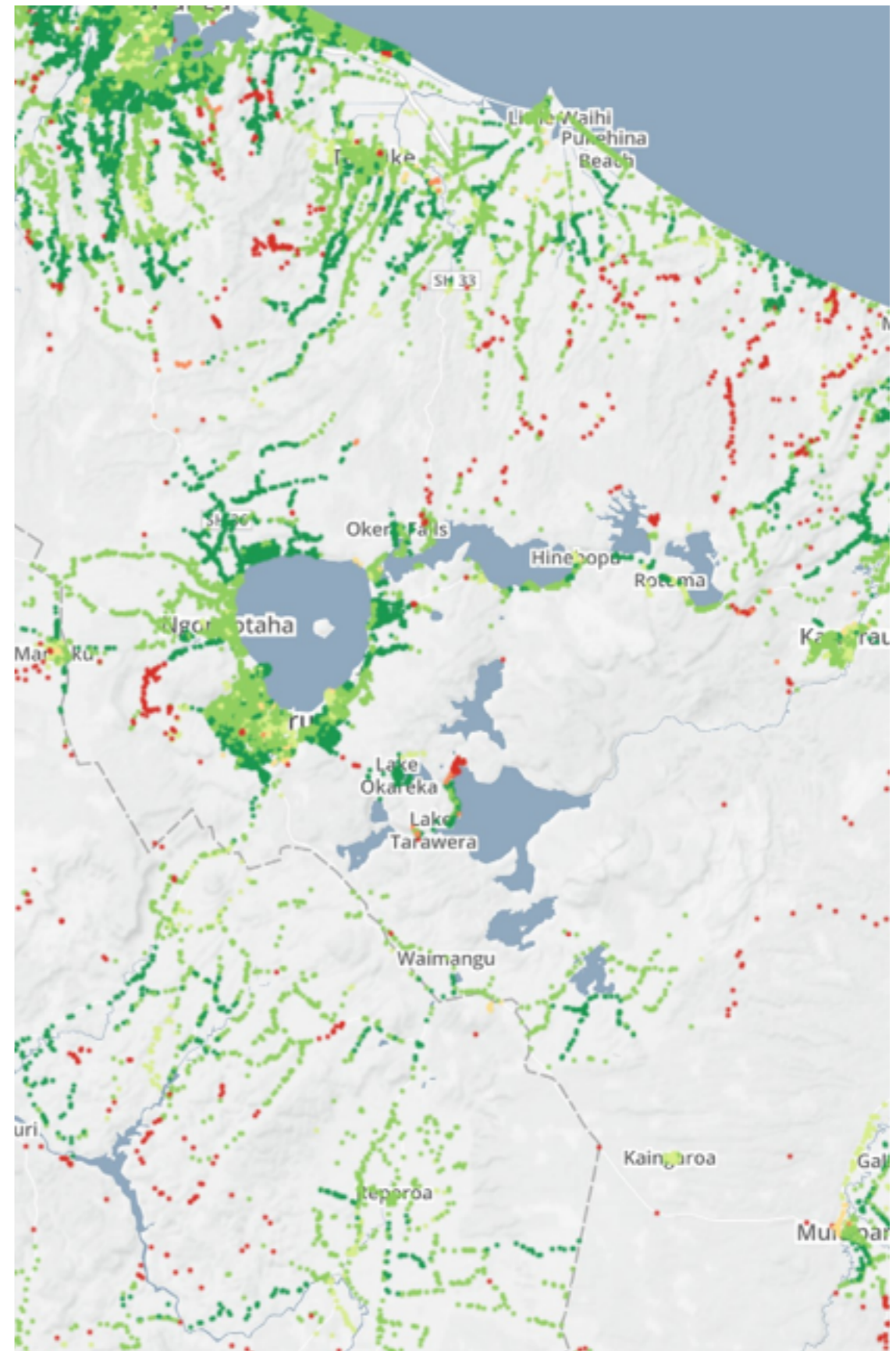


1.77 Million Houses vs. coverage for
Fibre, ADSL, Fixed Wireless, Satellite

Colours:

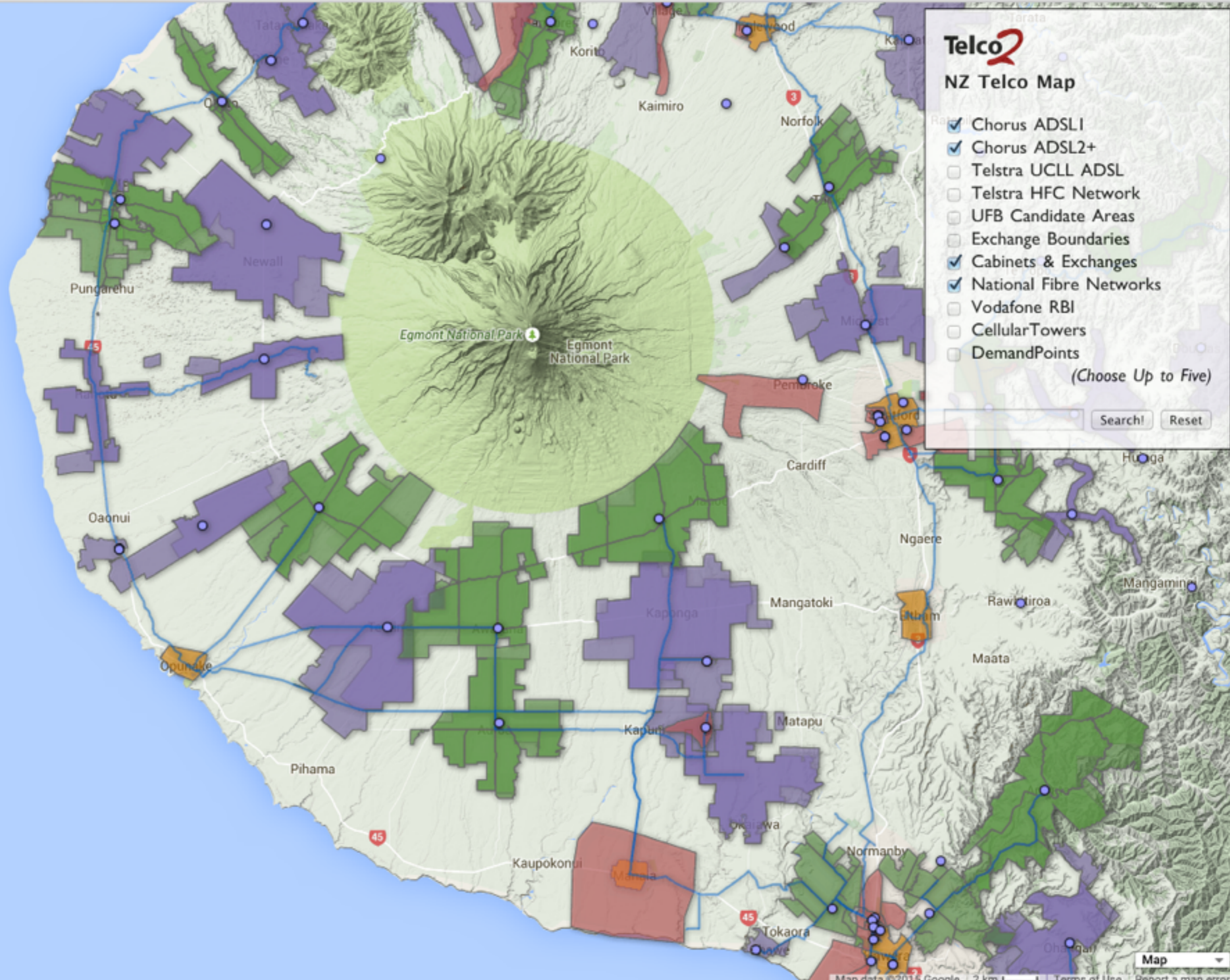
Dark Green: $< 2\%$ HHI

Red: $> 5\%$ HHI



Inputs: Coverage + Census

- Median Household Income for 42k Census Areas
- 1.77m Addresses from Electoral Role
- Telco Coverage Data from National Carriers
- Approximately \$400 in EC2 charges

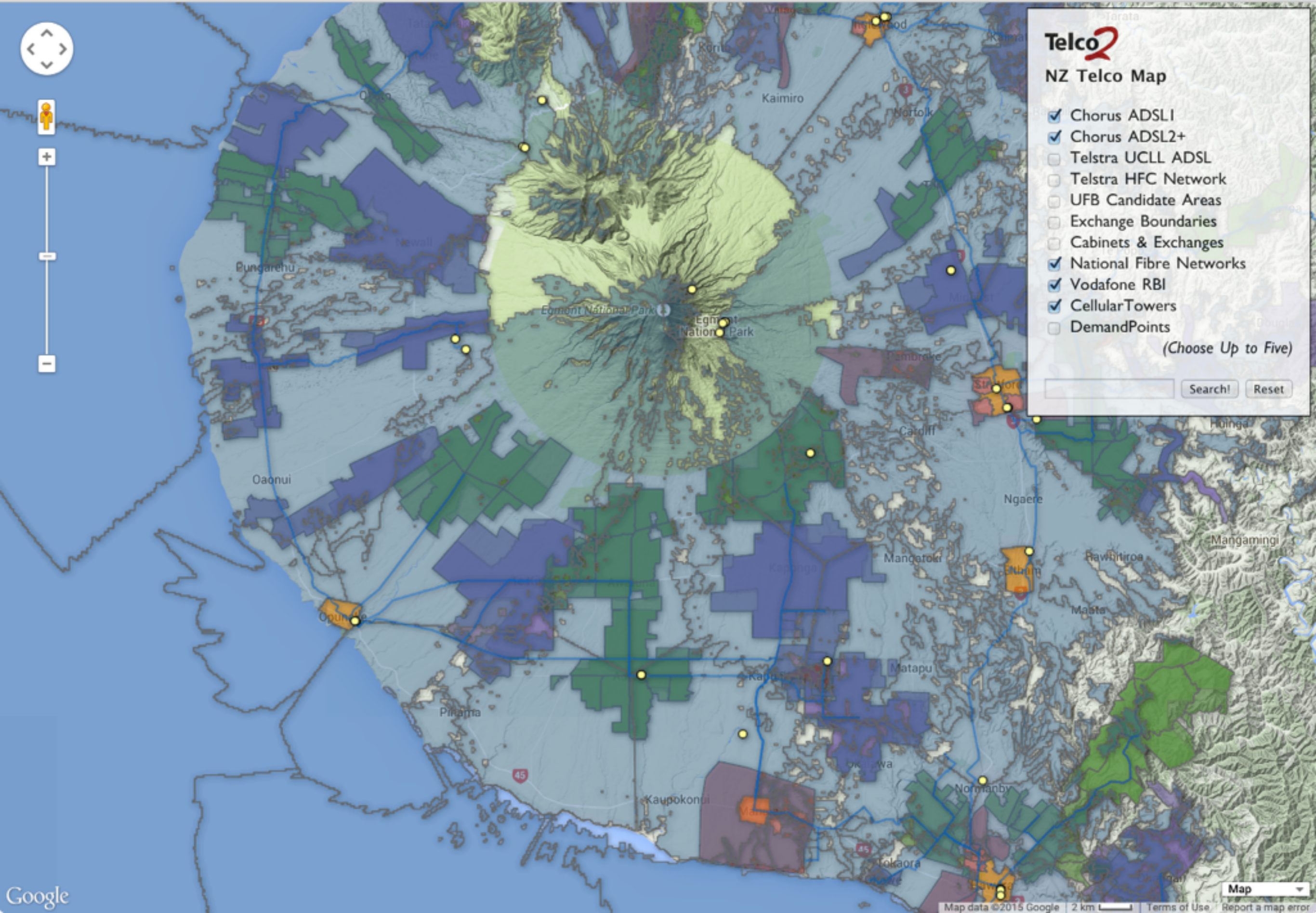


Telco2 NZ Telco Map

- Chorus ADSL1
- Chorus ADSL2+
- Telstra UCLL ADSL
- Telstra HFC Network
- UFB Candidate Areas
- Exchange Boundaries
- Cabinets & Exchanges
- National Fibre Networks
- Vodafone RBI
- CellularTowers
- DemandPoints

(Choose Up to Five)

Search! Reset

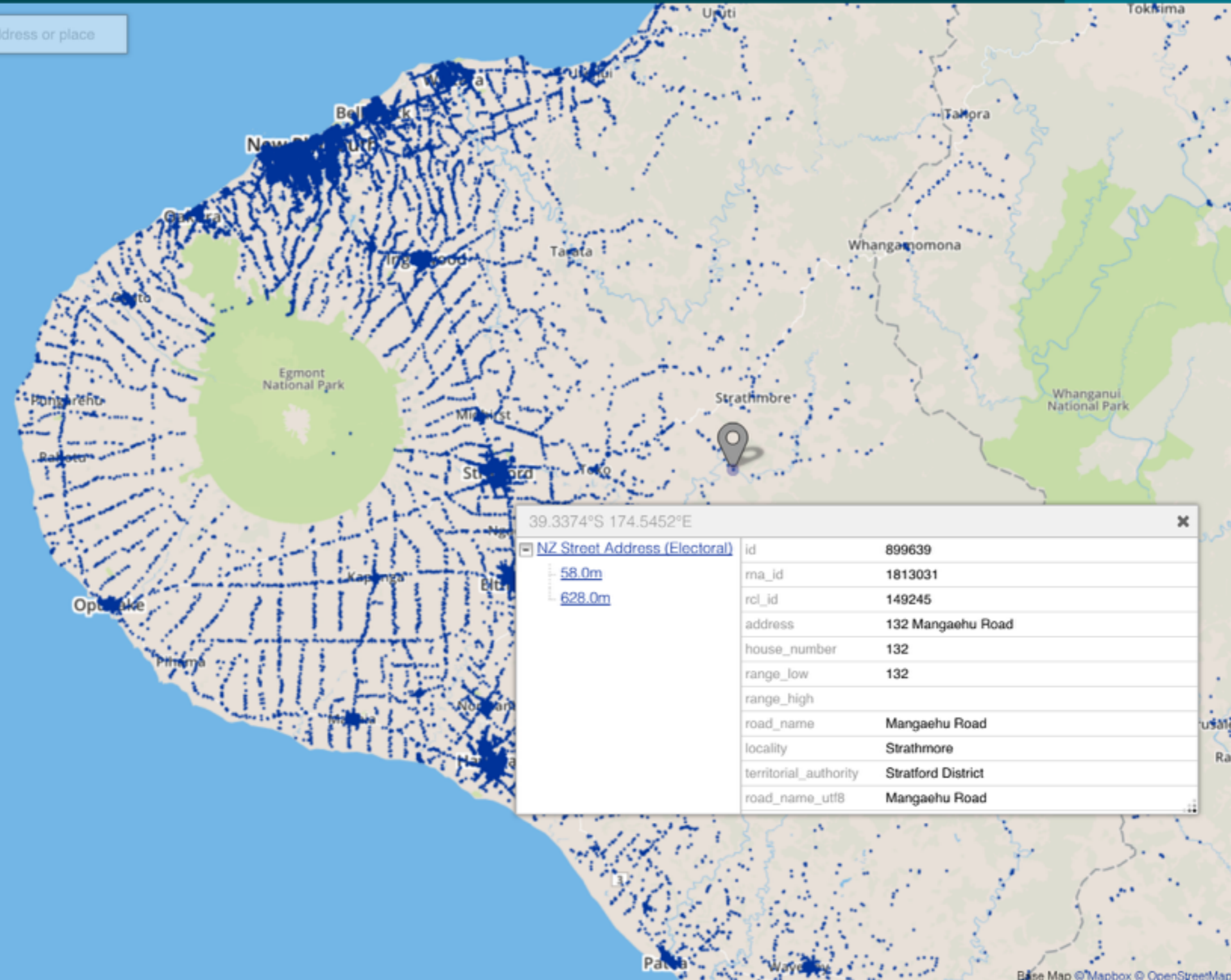


Telco2
NZ Telco Map

- Chorus ADSL1
- Chorus ADSL2+
- Telstra UCLL ADSL
- Telstra HFC Network
- UFB Candidate Areas
- Exchange Boundaries
- Cabinets & Exchanges
- National Fibre Networks
- Vodafone RBI
- CellularTowers
- DemandPoints

(Choose Up to Five)

Search! Reset



39.3374°S 174.5452°E

NZ Street Address (Electoral)	
id	899639
ma_id	1813031
rci_id	149245
address	132 Mangaehu Road
house_number	132
range_low	132
range_high	
road_name	Mangaehu Road
locality	Strathmore
territorial_authority	Stratford District
road_name_utf8	Mangaehu Road

Methodology

- Transform geoData Projections to WGS-84
- Import geoData into Postgres + PostGIS
- Assign each address a median income
 - 1.77 million points into 42k polygons
- Find coverage for each address
 - 1.77 million points into ~500,000k polygons


```

1. bitnami@ip-172-31-26-25: ~ (ssh)

 1 [|||||97.8%] 9 [|||||97.2%] 17 [|||||97.9%] 25 [|||||97.1%]
 2 [|||||96.3%] 10 [|||||97.9%] 18 [|||||97.1%] 26 [|||||97.1%]
 3 [|||||99.4%] 11 [|||||97.8%] 19 [|||||97.9%] 27 [|||||97.0%]
 4 [|||||97.1%] 12 [|||||98.6%] 20 [|||||96.3%] 28 [|||||95.7%]
 5 [|||||97.9%] 13 [|||||95.6%] 21 [|||||97.2%] 29 [|||||99.3%]
 6 [|||||97.1%] 14 [|||||96.4%] 22 [|||||97.8%] 30 [|||||97.9%]
 7 [|||||96.2%] 15 [|||||98.6%] 23 [|||||97.1%] 31 [|||||96.2%]
 8 [|||||96.5%] 16 [|||||97.8%] 24 [|||||96.4%] 32 [|||||97.1%]
Mem[|||||] 2378/60155MB Tasks: 114, 5 thr; 34 running
Swp[ ] 0/0MB Load average: 29.19 27.69 26.45
Uptime: 08:51:32

PID USER PRI NI VIRT RES SHR S CPU% MEM% TIME+ Command
8636 postgres 20 0 171M 124M 121M R 109. 0.2 0:02.29 postgres: postgres bbcost 127.0.0.1(40795) UPDATE
8628 postgres 20 0 172M 126M 122M R 108. 0.2 0:02.83 postgres: postgres bbcost 127.0.0.1(40791) UPDATE
8647 postgres 20 0 171M 102M 98M R 108. 0.2 0:02.16 postgres: postgres bbcost 127.0.0.1(40800) UPDATE
8650 postgres 20 0 171M 106M 102M R 108. 0.2 0:02.12 postgres: postgres bbcost 127.0.0.1(40802) UPDATE
8667 postgres 20 0 171M 91048 87124 R 108. 0.1 0:01.96 postgres: postgres bbcost 127.0.0.1(40810) UPDATE
8677 postgres 20 0 171M 70180 66384 R 108. 0.1 0:01.65 postgres: postgres bbcost 127.0.0.1(40815) UPDATE
8680 postgres 20 0 171M 49592 45780 R 108. 0.1 0:01.62 postgres: postgres bbcost 127.0.0.1(40817) UPDATE
8624 postgres 20 0 173M 130M 126M R 107. 0.2 0:02.89 postgres: postgres bbcost 127.0.0.1(40789) UPDATE
8627 postgres 20 0 172M 132M 128M R 107. 0.2 0:02.83 postgres: postgres bbcost 127.0.0.1(40790) UPDATE
8630 postgres 20 0 172M 132M 128M R 107. 0.2 0:02.79 postgres: postgres bbcost 127.0.0.1(40792) UPDATE
8648 postgres 20 0 171M 97908 93892 R 107. 0.2 0:02.14 postgres: postgres bbcost 127.0.0.1(40801) UPDATE
8672 postgres 20 0 171M 85492 81596 R 107. 0.1 0:01.89 postgres: postgres bbcost 127.0.0.1(40813) UPDATE
8674 postgres 20 0 171M 72032 68208 R 107. 0.1 0:01.68 postgres: postgres bbcost 127.0.0.1(40814) UPDATE
8632 postgres 20 0 171M 111M 107M R 106. 0.2 0:02.31 postgres: postgres bbcost 127.0.0.1(40793) UPDATE
8634 postgres 20 0 171M 107M 103M R 106. 0.2 0:02.30 postgres: postgres bbcost 127.0.0.1(40794) UPDATE
8638 postgres 20 0 171M 89452 85424 R 106. 0.1 0:02.18 postgres: postgres bbcost 127.0.0.1(40796) UPDATE
8641 postgres 20 0 171M 110M 106M R 106. 0.2 0:02.16 postgres: postgres bbcost 127.0.0.1(40797) UPDATE
8643 postgres 20 0 171M 98M 97048 R 106. 0.2 0:02.14 postgres: postgres bbcost 127.0.0.1(40798) UPDATE
8645 postgres 20 0 171M 98M 96524 R 106. 0.2 0:02.12 postgres: postgres bbcost 127.0.0.1(40799) UPDATE
8656 postgres 20 0 171M 80744 76752 R 106. 0.1 0:02.06 postgres: postgres bbcost 127.0.0.1(40805) UPDATE
8658 postgres 20 0 171M 93684 89700 R 106. 0.2 0:02.04 postgres: postgres bbcost 127.0.0.1(40806) UPDATE
8660 postgres 20 0 171M 72560 68604 R 106. 0.1 0:01.98 postgres: postgres bbcost 127.0.0.1(40807) UPDATE
8663 postgres 20 0 171M 87868 83920 R 106. 0.1 0:01.97 postgres: postgres bbcost 127.0.0.1(40808) UPDATE
8678 postgres 20 0 171M 49060 45260 R 106. 0.1 0:01.62 postgres: postgres bbcost 127.0.0.1(40816) UPDATE
8682 postgres 20 0 171M 47480 43708 R 106. 0.1 0:01.55 postgres: postgres bbcost 127.0.0.1(40818) UPDATE
8652 postgres 20 0 171M 83120 79128 R 105. 0.1 0:02.08 postgres: postgres bbcost 127.0.0.1(40803) UPDATE
8655 postgres 20 0 171M 96856 92856 R 105. 0.2 0:02.06 postgres: postgres bbcost 127.0.0.1(40804) UPDATE
8665 postgres 20 0 171M 69928 65988 R 105. 0.1 0:01.94 postgres: postgres bbcost 127.0.0.1(40809) UPDATE
F1Help F2Setup F3Search F4Filter F5Tree F6SortBy F7Nice -F8Nice +F9Kill F10Quit

```

- Postgres queries are single threaded
- Factor your queries & use Gnu Parallel

```
id,ta2013,ta2013_nam,au2013,au2013_nam,ua2013,ua2013_nam,ward2013,ward2013_nam,cb2013,cb2013_nam,regc2013,regc2013_nam,con2013,con2013_nam,land2013,land2013_nam,ufb,vdsl,dsl,rbi,area_median_hhi,percent_hhi,latitude,longitude
1554450,063,Ashburton District,597840,Ashburton Central East,112,Ashburton,06303,Ashburton Ward,06399,Area Outside Community,13,Canterbury Region,1307,Rakaia Constituency,12,12,t,t,t,,37500,1.76,-43.9038936833,171.7554329
394733,047,Wellington City,577400,Karaka Bay-Worser Bay,020,Wellington Zone,04704,Eastern Ward,04799,Area Outside Community,09,Wellington Region,0905,Wellington Constituency,12,12,t,t,t,,150000,0.44,-41.3196651,174.8250212833
356297,047,Wellington City,574600,Wadestown,020,Wellington Zone,04702,Onslow-Western Ward,04799,Area Outside Community,09,Wellington Region,0905,Wellington Constituency,12,12,t,t,t,,83300,0.79,-41.2655636,174.7696908333
38131,071,Dunedin City,604130,Kemure,023,Dunedin,07103,Central Ward,07199,Area Outside Community,14,Otago Region,1404,Dunedin Constituency,12,12,t,t,t,,81300,0.81,-45.8869750667,170.4670915
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31895,071,Dunedin City,601900,Fairfield,023,Dunedin,07103,Central Ward,07104,Saddle Hill Community,14,Otago Region,1404,Dunedin Constituency,12,12,t,t,t,,45000,1.47,-45.8969718333,170.4022048
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346267,047,Wellington City,574800,Karori North,020,Wellington Zone,04702,Onslow-Western Ward,04799,Area Outside Community,09,Wellington Region,0905,Wellington Constituency,12,12,t,t,t,,150000,0.44,-41.2810736,174.7422622833
391586,047,Wellington City,572701,Linden,020,Wellington Zone,04701,Northern Ward,04702,Tawa Community,09,Wellington Region,0902,Porirua-Tawa Constituency,12,12,t,t,t,,125000,0.53,-41.15701955,174.82808335
387954,047,Wellington City,577601,Maupuia,020,Wellington Zone,04704,Eastern Ward,04799,Area Outside Community,09,Wellington Region,0905,Wellington Constituency,12,12,t,t,t,,56700,1.16,-41.3077487667,174.81786435
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1444862,070,Queenstown-Lakes District,608800,Wanaka,293,Wanaka,07002,Wanaka Ward,07001,Wanaka Community,14,Otago Region,1401,Dunstan Constituency,12,12,t,t,t,,65000,1.02,-44.68478815,169.14104311667
379396,047,Wellington City,576901,Kilbirnie East,020,Wellington Zone,04704,Eastern Ward,04799,Area Outside Community,09,Wellington Region,0905,Wellington Constituency,12,12,t,t,t,,92500,0.71,-41.3200146167,174.8012564333
391459,047,Wellington City,572701,Linden,020,Wellington Zone,04701,Northern Ward,04702,Tawa Community,09,Wellington Region,0902,Porirua-Tawa Constituency,12,12,t,t,t,,80000,0.83,-41.1569399667,174.82864715
391897,047,Wellington City,572600,Tawa Central,020,Wellington Zone,04701,Northern Ward,04702,Tawa Community,09,Wellington Region,0902,Porirua-Tawa Constituency,12,12,t,t,t,,88000,0.75,-41.17049705,174.8290407667
392927,047,Wellington City,574001,Newlands South,020,Wellington Zone,04701,Northern Ward,04799,Area Outside Community,09,Wellington Region,0905,Wellington Constituency,12,12,t,t,t,,75000,0.88,-41.2223792667,174.83000985
396654,047,Wellington City,572701,Linden,020,Wellington Zone,04701,Northern Ward,04702,Tawa Community,09,Wellington Region,0902,Porirua-Tawa Constituency,12,12,t,t,t,,75000,0.88,-41.1517240833,174.8356031667
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391187,047,Wellington City,572701,Linden,020,Wellington Zone,04701,Northern Ward,04702,Tawa Community,09,Wellington Region,0902,Porirua-Tawa Constituency,12,12,t,t,t,,90000,0.73,-41.1556395833,174.8349477333
72874,068,Waitaki District,601030,Oamaru Central,114,Oamaru,06802,Oamaru Ward,06899,Area Outside Community,14,Otago Region,1402,Moeraki Constituency,12,12,t,t,t,,39100,1.69,-45.0995706,170.9655744333
73509,068,Waitaki District,601040,Oamaru South,114,Oamaru,06802,Oamaru Ward,06899,Area Outside Community,14,Otago Region,1402,Moeraki Constituency,12,12,t,t,t,,55000,1.20,-45.1085395667,170.9654473
73711,068,Waitaki District,601020,Orana Park,114,Oamaru,06802,Oamaru Ward,06899,Area Outside Community,14,Otago Region,1402,Moeraki Constituency,12,12,t,t,t,,32500,2.03,-45.0806465333,170.9805316167
71285,068,Waitaki District,601040,Oamaru South,114,Oamaru,06802,Oamaru Ward,06899,Area Outside Community,14,Otago Region,1402,Moeraki Constituency,12,12,t,t,t,,27500,2.40,-45.10608825,170.9540838167
74652,068,Waitaki District,601010,Oamaru North,114,Oamaru,06802,Oamaru Ward,06899,Area Outside Community,14,Otago Region,1402,Moeraki Constituency,12,12,t,t,t,,55000,1.20,-45.0646651333,170.9920399167
67500,068,Waitaki District,601200,Palmerston,501,Rural Centre,06803,Waihemo Ward,06802,Waihemo Community,14,Otago Region,1402,Moeraki Constituency,12,12,t,t,t,,55000,1.20,-45.4845689167,170.7067625333
71635,068,Waitaki District,601040,Oamaru South,114,Oamaru,06802,Oamaru Ward,06899,Area Outside Community,14,Otago Region,1402,Moeraki Constituency,12,12,t,t,t,,42500,1.55,-45.1034325167,170.9559766333
821457,024,Rotorua District,540600,Fenton,010,Rotorua,02499,Area Outside Ward,02499,Area Outside Community,04,Bay of Plenty Region,0403,Rotorua Constituency,12,12,t,t,t,,46700,1.41,-38.1510139167,176.258176
1419326,068,Waitaki District,601010,Oamaru North,114,Oamaru,06802,Oamaru Ward,06899,Area Outside Community,14,Otago Region,1402,Moeraki Constituency,12,12,t,t,t,,72500,0.91,-45.0646053333,170.9862651
392466,047,Wellington City,573511,Glenside North,020,Wellington Zone,04701,Northern Ward,04799,Area Outside Community,09,Wellington Region,0905,Wellington Constituency,12,12,t,t,t,,125000,0.53,-41.1912110667,174.82711265
1742219,047,Wellington City,572701,Linden,020,Wellington Zone,04701,Northern Ward,04702,Tawa Community,09,Wellington Region,0902,Porirua-Tawa Constituency,12,12,t,t,t,,75000,0.88,-41.151924,174.8355449
391748,047,Wellington City,572701,Linden,020,Wellington Zone,04701,Northern Ward,04702,Tawa Community,09,Wellington Region,0902,Porirua-Tawa Constituency,12,12,t,t,t,,45000,1.47,-41.1623572,174.8294246667
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391716,047,Wellington City,572701,Linden,020,Wellington Zone,04701,Northern Ward,04702,Tawa Community,09,Wellington Region,0902,Porirua-Tawa Constituency,12,12,t,t,t,,45000,1.47,-41.1628398667,174.8297065833
397278,047,Wellington City,573522,Grenada North,020,Wellington Zone,04701,Northern Ward,04702,Tawa Community,09,Wellington Region,0902,Porirua-Tawa Constituency,12,12,t,t,t,,67500,0.98,-41.1896527167,174.8359375333
116532,074,Gore District,610230,Central Gore,115,Gore,07403,Gore Ward,07499,Area Outside Community,15,Southern Region,1502,Eastern-Dome Constituency,12,12,t,t,t,,32100,2.06,-46.0978667833,168.9436708
361926,047,Wellington City,574402,Ngalo South,020,Wellington Zone,04702,Onslow-Western Ward,04799,Area Outside Community,09,Wellington Region,0905,Wellington Constituency,12,12,t,t,t,,116700,0.57,-41.2505202333,174.7825861333
46461,071,Dunedin City,604110,Mornington,023,Dunedin,07103,Central Ward,07199,Area Outside Community,14,Otago Region,1404,Dunedin Constituency,12,12,t,t,t,,79200,0.83,-45.8894283,170.4875235167
1584678,071,Dunedin City,604620,Vauxhall,023,Dunedin,07103,Central Ward,07199,Area Outside Community,14,Otago Region,1404,Dunedin Constituency,12,12,t,t,t,,82000,0.80,-45.8811936167,170.5357533667
38229,071,Dunedin City,604210,Caversham,023,Dunedin,07103,Central Ward,07199,Area Outside Community,14,Otago Region,1404,Dunedin Constituency,12,12,t,t,t,,45000,1.47,-45.8959786,170.4677732833
1671570,047,Wellington City,574001,Newlands South,020,Wellington Zone,04701,Northern Ward,04799,Area Outside Community,09,Wellington Region,0905,Wellington Constituency,12,12,t,t,t,,80000,0.83,-41.2333739833,174.8186631833
117934,073,Southern District,610000,Toetoes,502,Rural (Incl. some Off Shore Islands),07311,Toetoes Ward,07399,Area Outside Community,15,Southern Region,1505,Southern Constituency,12,12,t,t,t,,55000,1.20,-46.5634368,168.94871478333
113964,074,Gore District,610400,Mataura,115,Gore,07404,Mataura Ward,07401,Mataura Community,15,Southern Region,1502,Eastern-Dome Constituency,12,12,t,t,t,,45000,1.47,-46.19984395,168.86724003333
50902,071,Dunedin City,604110,Mornington,023,Dunedin,07103,Central Ward,07199,Area Outside Community,14,Otago Region,1404,Dunedin Constituency,12,12,t,t,t,,65000,1.02,-45.8811167833,170.4752874333
40213,071,Dunedin City,604020,Roslyn South,023,Dunedin,07103,Central Ward,07199,Area Outside Community,14,Otago Region,1404,Dunedin Constituency,12,12,t,t,t,,96300,0.69,-45.8709508667,170.4832585833
38287,071,Dunedin City,604210,Caversham,023,Dunedin,07103,Central Ward,07199,Area Outside Community,14,Otago Region,1404,Dunedin Constituency,12,12,t,t,t,,55000,1.20,-45.8959557167,170.4657055
```

Result: 1.77m line CSV

<http://telco2.co.nz/bbafford.html>

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@kiwibrew