NEW ZEALAND
INFRASTRUCTURE
COMMISSION
Te Waihanga

What's fair when it comes to paying for infrastructure? Insights and findings

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New Zealand Infrastructure Commission / Te Waihanga

Te Waihanga seeks to transform infrastructure for all New Zealanders. By doing so our goal is to lift the economic performance of Aotearoa and improve the wellbeing of all New Zealanders.
We are an autonomous Crown entity, listed under the Crown Entities Act 2004, with an independent board. We were established by the New Zealand Infrastructure Commission/Te Waihanga Act 2019 on 25 September 2019. Information on the Commission is available at www.tewaihanga.govt.nz/

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Key findings and insights

1. **Higher-income households pay more in total towards infrastructure but less as a proportion of income.** The average household spends about 16% of their after-tax income on infrastructure services, or about $13,500 a year. While households spend more on infrastructure as income rises, expenditure does not increase as quickly as income.

2. **Households that appear similar can spend very different amounts on infrastructure services and there is more diversity in spending patterns within income groups than between them.** Observable factors such as income, location, and household composition explain about two-thirds of the variation in spending on infrastructure. We were unable to conclude there is statistically significant difference between what Māori households and non-Māori households spend on infrastructure services.

3. **New Zealanders hold a range of views about what are fair ways to pay for infrastructure services and these views often differ across sectors.** For example, three-quarters of New Zealanders thought it was fair to pay for electricity and water based on usage, but there was no agreement on how best to pay for roads. Views about what's fair are often consistent with self-interest and can change over time.

4. **There is a general expectation in New Zealand that location and cost to supply will not be a barrier to receiving a minimum level of infrastructure service. However, this does not mean that all households pay the same or enjoy the same level of service quality.** Quality can be lower and/or services can be more expensive in rural areas. Providing access to infrastructure services for distant and sparsely populated areas can involve high per-person costs, and the expectation of broad access can create unrealistic expectations about service standards.

5. **How infrastructure charges are structured has implications for how they are distributed across households, and subsequently, for fairness.** Infrastructure services are often funded via a combination of fixed and variable charges, and both play a part in raising revenue. Fixed charges take up a greater proportion of the income of lower income households and cannot be avoided. Variable charges allow households to adjust their infrastructure use and costs to suit their circumstances. Distributional analysis helps decision-makers understand the impact on household budgets of changing the mix of fixed and variable charges on different households.

6. **Funding and pricing are powerful tools for achieving our infrastructure goals, but they also have implications for how the costs of infrastructure are distributed, and what New Zealanders perceive as fair.** Perceptions about fairness are an important factor in whether new and different approaches to paying for infrastructure gain broad public acceptance. Decision-makers should:

    a. **Use distributional analysis to inform decision-making:** When providing advice to decision-makers, officials should undertake distributional analysis to understand the effect on different households of changing infrastructure charging structures.

    b. **Not let current opinion about what's fair prevent beneficial policy changes:** People's support for different ways of charging for infrastructure can change – especially once they see the benefits of doing so.

    c. **Use pricing to guide infrastructure investment and efficient use while also creating a fairer system now and for future generations:** Charges that reflect the costs of providing infrastructure provide the revenue to keep our networks running

but also allow households to manage their own infrastructure costs. Good pricing can mean that new investments are better aligned with demand now and for future generations of infrastructure users. Pricing that incentivises more consistent investment in renewals and maintenance leaves assets in a better state for future generations.

d. **Find ways to reduce the cost of infrastructure to benefit all New Zealanders – especially those on lower incomes:** Cost savings and efficiencies benefit everyone, but low-income households would benefit the most since they bear the biggest proportionate (relative to income) burden of the costs of infrastructure.

Contents

1. 'What's Fair' research programme

We need to respond to infrastructure challenges in smarter ways

Improvements in our infrastructure services have made our lives safer, healthier and easier. Plentiful and reliable electricity means that we don't have to rely on coal to heat our homes, reducing air pollution and health problems. More reliable wastewater systems mean that we are less likely to damage fragile marine ecosystems. Fast internet and broad mobile coverage means we can easily stay in touch with friends and family around the world, and access information effortlessly.

However, New Zealand has current and future infrastructure challenges. Too many of the country's water pipes leak, drinking water health standards aren't met and wastewater continues to pollute the environment. The transport system needs sustainable funding and better tools for managing congestion. We need to build more renewable electricity generation and transmission, so that New Zealand can decarbonise. Some of our infrastructure assets are at risk from the effects of climate change, such as sea level rise and flooding.

Getting the infrastructure services we need means doing things differently, including changing how we pay for them. This may mean the costs of infrastructure might fall differently across the community. Some worry that changing how we pay for infrastructure will make life harder for some households. These concerns are understandable, but not always founded in evidence.

How this work connects to the New Zealand Infrastructure Strategy

The New Zealand Infrastructure Commission exists to help New Zealand get the best from its infrastructure. One way the Commission does this is by producing a 30-year Infrastructure Strategy which lays out a vision for New Zealand's future infrastructure, identifies barriers and opportunities, and recommends changes to achieve that vision. The first Infrastructure Strategy was released in 2022.[1]

The first Infrastructure Strategy included a recommendation to 'improve public understanding of how infrastructure is funded', including how 'infrastructure is priced in different infrastructure sectors, and what implications this has for equity and the quality of infrastructure provision'. This recommendation 56 reflected an understanding that funding and pricing are powerful tools for achieving our infrastructure goals, but also have implications for how New Zealanders pay for infrastructure.

This report summarises the insights from many different research projects that made up the 'What's Fair' research programme

This report, and the research that underpins it, are part of our response to recommendation 56.[2] We wanted to understand:

- how New Zealanders think about fairness in the context of infrastructure services
- how well the current infrastructure system achieves outcomes that are perceived as fair
- what could be done differently in the future to meet our infrastructure challenges in a way that New Zealanders can accept as being fair.

Fairness in infrastructure has many aspects, including affordability, accessibility, and quality. However, in line with recommendation 56 in the Infrastructure Strategy, this work focuses primarily on questions of funding and pricing – who pays for infrastructure, how they pay, and how much they pay. The project

[1] NZ Infrastructure Commission (2022). 'Rautaki Hanganga o Aotearoa – New Zealand Infrastructure Strategy'. https://media.umbraco.io/te-waihanga-30-year-strategy/k0hnqufg/rautaki-hanganga-o-aotearoa.pdf

[2] See also https://tewaihanga.govt.nz/our-work/research-insights/network-infrastructure-pricing-study

concentrated on the four networked infrastructure services that most, if not all, New Zealanders use every day: mains (drinking) water, electricity, telecommunications, and land transport.

This report summarises the insights from many different research projects that made up the 'What's Fair' research programme and is supported by a variety of supplementary and technical reports.[3]

[3] All are available on our website https://tewaihanga.govt.nz/our-work/key-topics/what-is-fair-providing-and-paying-for-infrastructure

2. How much do New Zealanders spend on infrastructure?

Key findings and insights

1. **Higher-income households pay more in total towards infrastructure but less as a proportion of income.** The average household spends about 16% of their after-tax income on infrastructure services, or about $13,500 a year. While households spend more on infrastructure as income rises, expenditure does not increase as quickly as income.
2. **Households that appear similar can spend very different amounts on infrastructure services and there is more diversity in spending patterns within income groups than between them.** Observable factors such as income, location, and household composition explain about two-thirds of the variation in spending on infrastructure. We were unable to conclude there is statistically significant difference between what Māori households and non-Māori households spend on infrastructure services.

2.1 Higher-income households pay more in total towards infrastructure but less as a proportion of income

Infrastructure services today make up a significant share of household spending. The average household spends about 16% of their after-tax income on infrastructure services, or about $13,500 a year..[4] This rises to over $20,000 a year for households in the highest income quintile. Private transport (including the cost of buying and running a car to access local and national roading infrastructure) is the single largest expense, making up 55% of the average household's infrastructure spending.

Household expenditure on infrastructure increases more slowly than household income rises. So, while higher-income households pay more in total towards infrastructure, this makes up a smaller proportion of their total income: 12% on average for the highest income quintile compared to 37% for the lowest income quintile..[5]

2.2 Households that appear similar often spend very different amounts

Our analysis revealed more diversity in spending patterns within income groups than between them. For example, while the average household in the lowest income quintile spent around one-third (37%) of its disposable income on infrastructure services, one in six low-income households spent less than 10% which is a lower ratio than the average household in the highest income quintile.

Low-income households include retirees, students, and welfare recipients and each of these groups has quite different levels of assets, future expected incomes, and spending patterns – including on infrastructure services. For example, of households in the lowest income quintile, retired households (77%) were more likely to own the dwelling they lived in than compared to only one-quarter (27%) of welfare recipients.

[4] NZ Infrastructure Commission. (2023). 'How much do we pay for infrastructure? Household expenditure on infrastructure services'. https://media.umbraco.io/te-waihanga-30-year-strategy/3segaqje/household-spending-on-infrastructure-services.pdf
[5] Ibid.

Observable factors (as outlined in **Table 1**) such as income, location, and household composition can explain about two-thirds of the variation in spending on infrastructure..[6] [7]

Table 1: Characteristics associated with higher and lower than average household spend on infrastructure services

Associated with higher spending	Associated with lower spending
• Higher after-tax income • More adults in a household • More working adults in a household • Presence and number of dependent children • Number of bedrooms in dwelling • Living in a crowded dwelling • Living in rural areas or regional towns • Car ownership	• Lower after-tax income • Renting (as opposed to owning) household's dwelling • Living in a local area (meshblock) that has a higher rate of deprivation • Living in a city

We were unable to conclude there is a statistically significant difference between what Māori and non-Māori households spend on infrastructure services. Māori households were more likely to have characteristics that were associated with both higher and lower than average spending which balance each other out..[8]

[6] NZ Infrastructure Commission. (2024). 'Drivers of household expenditure on infrastructure: An analysis of the factors that explain variations in household infrastructure spending'. https://tewaihanga.govt.nz/our-work/key-topics/what-is-fair-providing-and-paying-for-infrastructure

[7] NZ Infrastructure Commission. (2023). 'How much do we pay for infrastructure? Household expenditure on infrastructure services'. https://media.umbraco.io/te-waihanga-30-year-strategy/3segaqje/household-spending-on-infrastructure-services.pdf

[8] Firecone & Sawtooth Economics. (2024). 'Māori household expenditure on infrastructure services – an investigation of the relationship between Māori ethnicity and household infrastructure spending'. https://tewaihanga.govt.nz/our-work/key-topics/what-is-fair-providing-and-paying-for-infrastructure

3. What do New Zealanders think is 'fair'?

Key findings and insights

3. **New Zealanders hold a range of views about what are fair ways to pay for infrastructure services and these views often differ across sectors.** For example, three-quarters of New Zealanders thought it was fair to pay for electricity and water based on usage, but there was no agreement on how best to pay for roads. Views about what's fair are often consistent with self-interest and can change over time.
4. **There is a general expectation in New Zealand that location and cost to supply will not be a barrier to receiving a minimum level of infrastructure service. However, this does not mean that all households pay the same or enjoy the same level of service quality.** Quality can be lower and/or services can be more expensive in rural areas. Providing access to infrastructure services for distant and sparsely populated areas can involve high per-person costs, and the expectation of broad access can create unrealistic expectations about service standards.

3.1 People can have quite different conceptions of what's fair

All the concepts below can be thought of as 'fair'[9] by some people and in some circumstances, and we saw examples of them all during our research.

- **Ability to pay:** Those with greater means (higher incomes) should bear a larger share of the costs of providing an infrastructure service.
- **Horizonal fairness:** Those in similar circumstances (for example, a similar income or living in the same area) should pay a similar share or amount for an infrastructure service.
- **Intergenerational fairness:** Different generations should face a similar balance of the costs and benefits from an investment in infrastructure.
- **Polluter pays principle:** People should pay an amount roughly equal to the costs they impose on others from using infrastructure.
- **Beneficiary pays principle:** People should pay more if they receive greater benefits from infrastructure.

Some of these conceptions of fairness can be in direct conflict with each other, which presents problems for policy-makers.

For example, policies to promote energy efficiency and low-carbon technologies can reduce costs and harms for future generations. However, policy-makers designing energy efficiency policies know that higher-income households have a greater ability to pay for electric vehicles and other assets that reduce direct energy costs (for example, solar panels, batteries) but they also benefit from subsidies to encourage the uptake of these goods. Conversely, lower-income households are more likely to have older vehicles that are less fuel efficient and environmentally friendly and low-income households are less likely to be in a position to buy an electric vehicle. Emissions charges designed to discourage people from owning and driving older vehicles are therefore more likely to burden lower-income households.

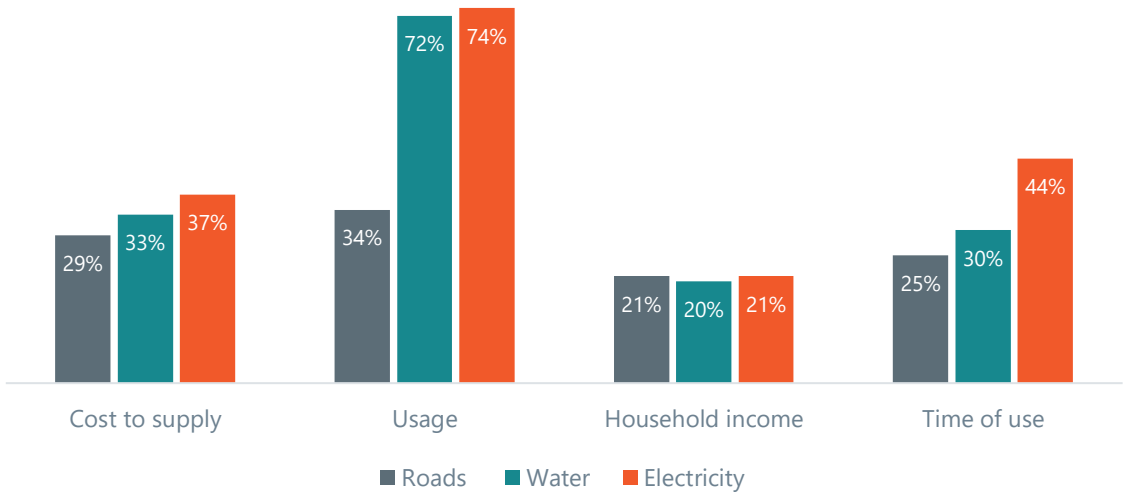
[9] Some literature uses the term 'equity' to capture these dimensions. For this work, we have used 'fairness', as it is a plain English term and hence more easily understood.

3.2 Different views about what's fair were revealed in a survey of New Zealanders

In 2023 we surveyed a representative sample of 3,002 New Zealanders to better understand what people think is fair when it comes to paying for infrastructure.[10] Three-quarters (72–74%) of respondents thought it was fair that people pay for electricity and drinking water based on usage. However, only a third (34%) agreed it was fair to charge for roads based on usage. Most respondents did not think that any of the proposed ways of paying for roads, based on road use, or the cost to supply, or based on household income, was fair (**Figure 1**).

Most people think paying for water and electricity based on usage is fair

Figure 1: Percentage of respondents who agree it is fair that what households pay for roads, water, and electricity should differ based on cost to supply, usage, household income, and time of use



Source: Kantar Public

We found that what people think is 'fair' often coincides with self-interest. In the public perceptions survey:

- Around 70% of respondents did not think it was fair that what households pay for electricity, mains water and roads should differ based on household income. However, respondents from lower-income households were more likely to agree that this would be a fair way to pay.
- Rural residents – who would likely face higher costs of supplying infrastructure services – were more likely to agree it would be unfair to pay based on the cost of supplying electricity, water or roads to their area, compared to respondents living in large cities.[11]

[10] NZ Infrastructure Commission. (2024). 'What New Zealanders think is a fair way to pay for infrastructure: Survey insights'. https://media.umbraco.io/te-waihanga-30-year-strategy/nqfm3lif/what-new-zealanders-think-is-a-fair-way-to-pay-for-infrastructure-survey-insights.pdf

[11] Ibid.

Support for broad access to infrastructure services was also evident in our public perceptions survey. More than half of respondents did not think it would be fair to charge for infrastructure services based on the cost of supplying electricity (55%), water (57%), or roads (60%).[12]

3.3 We can also infer views about fairness from the policy decisions that have been made

3.3.1 There is a longstanding theme in New Zealand infrastructure policy that the cost to supply shouldn't be a barrier to accessing infrastructure

The idea that the cost to supply infrastructure shouldn't be a barrier to access, especially for people living in rural or remote areas, is longstanding in New Zealand infrastructure policy. For example, in the aftermath of World War Two electricity customers were charged a levy to pay for investments to expand the lines network into rural areas.[13] More recently we've had the Rural Broadband Initiative, Rural Capacity Upgrades and Remote Users Scheme.

3.3.2 But this does not mean that all households receive the same level of service quality or pay the same for a similar service

Infrastructure is subject to economies of scale and density, meaning that it can be cheaper to provide services in cities, as people are more densely located, and there are more people over which to spread the cost. These factors also make it more viable to offer more services in cities, such as regular public transport, higher-speed internet and reliable mobile telecommunications. Greater population density also supports more competition, which helps keep prices down.

It is therefore unsurprising that differences in service quality and prices are most pronounced in rural areas. For example:

- While urban households can pay $60–$100/month for an unlimited fibre connection, rural areas may be required to pay $150–$160/month and incur hardware costs. Installation costs range from $600 to $2000 for a satellite connection.
- Smaller water suppliers (which are more common in rural areas) are less likely to comply with legislated safety requirements.[14] Charges for drinking and wastewater are also much more variable for rural and regional households.[15] [16]
- Roads in rural areas are more likely to be assessed as 'high' or 'medium high' risk based on the NZ Transport Agency's Infrastructure Risk Rating.[17]
- Electricity charges (per kWh) are generally higher in rural New Zealand and smaller regional centres.[18]

[12] NZ Infrastructure Commission. (2024). 'What New Zealanders think is a fair way to pay for infrastructure: Survey insights'. https://media.umbraco.io/te-waihanga-30-year-strategy/nqfm3lif/what-new-zealanders-think-is-a-fair-way-to-pay-for-infrastructure-survey-insights.pdf

[13] McLintock, A.H. (ed) (1966), 'Power resources'. An Encyclopedia of New Zealand. https://teara.govt.nz/en/1966/power-resources/page-5

[14] Ministry of Health. (2022). 'Annual report on drinking water quality 2020–2021'. https://www.health.govt.nz/system/files/documents/publications/annual-report-on-drinking-water-quality-2020-2021-mar22.pdf. Note that this report related to the Health Act 1956. Drinking water quality is now regulated under the Water Services Act 2021.

[15] Water New Zealand (2023), 'National Performance Review 2021/22'. https://www.waternz.org.nz/nationalperformancereview

[16] Note that some rural and regional councils charge for water through rates, while others use volumetric charging or a mix of rates and use-based charges.

[17] Ministry of Transport. 'Overview of road safety in New Zealand'. https://www.transport.govt.nz/assets/Uploads/Presentation/Overview-of-Road-Safety-in-NZ-Data-packs-for-reference-groups.pdf

[18] Based on our analysis of MBIE's 2022 Quarterly Domestic Electricity Prices Survey (QSDEP) https://www.mbie.govt.nz/building-and-energy/energy-and-natural-resources/energy-statistics-and-modelling/energy-statistics/energy-prices/electricity-cost-and-price-monitoring

Achieving broad access can be unrealistic and/or involve prohibitively high per-user costs. For example, the Ultrafast Broadband and Rural Broadband Initiatives provided access to fast internet to over 2.1 million users spread across the country, at an average cost to the government of $881–$2,167 per user. However, it was anticipated to cost $5.6 million, or $17,284 per end user, to provide broadband coverage to 324 end users on Great Barrier Island, Chatham Islands, and Stewart Island/Rakiura,[19] that is, the most remote parts of the country.

3.3.3 'Fairness' is not usually expressed as a priority in the laws and policies that govern infrastructure services

Many of New Zealand's key statutes (for example, Telecommunications Act 2001, Electricity Industry Act 2010 and Part 4 of the Commerce Act 1986)[20] emphasise efficiency as a core goal, often in purpose statements that seek to promote 'competition' or 'outcomes consistent with the outcomes produced in competitive markets' for 'the long-term benefit of consumers' or of 'end-users'.

Where fairness goals are expressed in infrastructure laws, they are generally for a limited set of circumstances or groups. For example, the Land Transport Management Act 2002 requires decision-makers to consider the needs of the 'transport-disadvantaged' while The Electricity Industry Act 2010 empowers the Governor-General to make regulations to protect 'rural consumers…from unfair rates of change in the prices charged to them'.[21]

The main exception is the Local Government Act 2002, which has a clear emphasis on intergenerational fairness.

3.3.4 Our infrastructure asset management practices suggest mixed focus on intergenerational fairness

A concern for intergenerational fairness implies that today's asset owners should pay attention to the state of their assets and take steps to maintain their performance or replace them at a suitable time, so that they are passed on in a similar or better condition to future users. Insufficient investment in maintaining and renewing assets leads to service failures and burdens on later generations, by shifting a growing volume of costs and risks onto future users.

Although there is limited information about renewal investment across the various infrastructure sectors, what we do have suggests that New Zealand is spending enough on flood protection and control work and electricity distribution, but not enough to renew state highways, local roads, gas pipelines, water supply, sewage treatment and disposal, and stormwater drainage infrastructure. In the case of state highways and local roads, this has led to declining asset conditions (implying lower quality services) for future users.[22]

For some networked services, especially where there is one monopoly provider (for example, electricity lines, fibre), government regulators oversee investment by setting quality standards that must be met, approving revenue levels and/or requiring service providers to disclose information on their performance. But not all services are subject to this degree of scrutiny.

[19] Crown Infrastructure Partners (2018). 'RBI1/MBSF expansion announcement – Questions and Answers'. https://www.beehive.govt.nz/sites/default/files/2018-12/RBI2-MBSF%20expansion%20Q%26A%20-%2018%20Dec%202018%20FINAL.pdf

[20] At the time of writing, some of the laws governing the supply of drinking water were scheduled to be repealed.

[21] Section 113 (1)(c)

[22] NZ Infrastructure Commission (2024). 'Build or maintain? New Zealand's infrastructure asset value, investment and depreciation, 1990–2022'. https://tewaihanga.govt.nz/our-work/research-insights/build-or-maintain

3.3.5 Policy around the appropriate discount rate has implications for intergenerational fairness

Infrastructure assets have long lives. Many proposals for new public infrastructure include benefit to cost calculations. Future costs and benefits are 'discounted' (reduced in value) so that they can be compared with costs and benefits today.[23] But this discounting means that projects with more immediate overall benefits are favoured over those with longer-term benefits. Any positive discount rate has this effect, but higher discount rates reduce the value of future benefits at a faster rate. This is likely to skew investment decisions in favour of current or near generations, over users further into the future.

Setting a discount rate is not an objective process and involves value judgements. Several high-income countries (not New Zealand) have set rates that decline over time, to recognise benefits that occur well into the future.[24] We recommended in the Infrastructure Strategy that the government 'undertake an inquiry into the appropriateness and consistent application of New Zealand's social discount rate policy, which determines how much weight is placed on future outcomes relative to present-day outcomes when analysing public infrastructure investments.'[25] The Treasury is continuing to work through options for changes to current practice.

[23] This discounting reflects the idea in economics that people value money today over money in the future. This preference for money today can be seen in the practice of banks paying interest on savings – to encourage people to give up access to today's money, banks need to pay investors more.
[24] Parliamentary Commissioner for the Environment (2021). 'Wellbeing budgets and the environment: A promised land?' https://pce.parliament.nz/publications/wellbeing-budgets-and-the-environment/
[25] NZ Infrastructure Commission (2022). 'Rautaki Hanganga o Aotearoa – New Zealand Infrastructure Strategy'. https://media.umbraco.io/te-waihanga-30-year-strategy/k0hnqufg/rautaki-hanganga-o-aotearoa.pdf

4. Changing how infrastructure is paid for has implications for fairness

Key findings and insights

5. **How infrastructure charges are structured has implications for how they are distributed across households, and subsequently, for fairness.** Infrastructure services are often funded via a combination of fixed and variable charges, and both play a part in raising revenue. Fixed charges take up a greater proportion of the income of lower income households and cannot be avoided. Variable charges allow households to adjust their infrastructure use and costs to suit their circumstances. Distributional analysis helps decision-makers understand the impact on household budgets of changing the mix of fixed and variable charges on different households.

4.1 We pay for infrastructure in a variety of ways

We pay for infrastructure in a variety of ways including through taxes, property rates, monthly bills for electricity, public transport fares, Fuel Excise Duty (FED) or Road User Charges (RUC), and others.[26]

Services are often funded via a combination of charges. For example, electricity is typically paid for via a monthly bill that includes a combination of variable and fixed user charges (daily charge). Public transport is funded via a combination of sources including fares from users, rates from local homeowners and businesses, and a portion of FED and RUC from drivers.

Infrastructure charging mechanisms are not fixed but can change by location and over time. For example, councils like Auckland, Tauranga, and Kāpiti Coast charge for mains (drinking) water by usage (volumetric charging) or a mix of volumetric and fixed charges, while other councils fund the supply of mains water through rates paid by homeowners and businesses. While households now pay based on usage, when electricity was first introduced in New Zealand, each household paid a flat annual fee based on the number of electric lights in the house.[27]

4.2 Changing how we pay for infrastructure changes how the costs are distributed

We used data from Stats NZ's Household Economic Survey to simulate the impact on household budgets of policy changes to how infrastructure services are charged.[28] By analysing final after-tax income under different charging policies, we could assess the impact on different households. Specifically, we were interested in whether a change in charging policy would be progressive, that is, lower-income households would be better off (at the expense of higher-income households), or regressive, that is, higher-income households would be better off (at the expense of lower-income

[26] For more about how infrastructure is paid for in New Zealand currently see our video 'How New Zealanders pay for infrastructure'. https://tewaihanga.govt.nz/watch-listen/videos/how-new-zealanders-pay-for-infrastructure

[27] Electricity Engineers' Association. 'Over 125 years of electricity supply'. https://www.eea.co.nz/Site/about/electricity-Industry/125-years.aspx

[28] Sawtooth Economics & Firecone. (2024). 'Simulating the impact of different ways of charging for infrastructure on households'. https://tewaihanga.govt.nz/our-work/key-topics/what-is-fair-providing-and-paying-for-infrastructure

households).[29] The simulations assumed relatively small price changes, and that the overall revenue collected for each infrastructure service didn't change, but the manner in which it was paid for, and who paid, did.

Fixed charges are regressive. Raising fixed charges for water, electricity, and private transport (for example, daily charges for water and electricity and car registration fees) had a disproportionately negative impact on lower-income households. Fixed charges require everyone to pay the same amount, regardless of income or usage. A household cannot reduce their expenses when they face a fixed charge, and fixed charges take up a greater proportion of the income of lower-income households. Fixed charges essentially involve averaging costs across users, so low users effectively end up subsidising high users.

Conversely, variable charges are generally better for lower-income households, as the charges better reflect actual use. Lower-income households are smaller on average, and so will tend to use less. Variable charges also better allow households to adjust their infrastructure use and costs to suit their circumstances.

We found examples of this in water and public transport:

- Decreasing rates and increasing a variable (volumetric) charge for water was found to be weakly progressive, that is, households on lower incomes could be better off.[30]
- Reducing public transport fares was found to benefit higher-income households more than lower-income households. This reflects who uses currently public transport in New Zealand. Only 8% of New Zealand households pay for public transport.[31] [32] They tend to have higher incomes, be younger and live in densely populated urban areas with jobs that align with public transport routes and schedules (typically a professional job in the central city). We saw evidence of this when half-price public transport fares were introduced in 2022 which saw households earning more than $100,000 add the most public transport journeys during this period.[33]

However, increasing revenue for infrastructure via fixed or variable charges may not matter much for above average income households. We simulated the impact on household budgets of raising $250 million in new revenue for transport, by either increasing vehicle registration fees (a fixed charge) or FED and RUC (both variable charges, that is, they vary with use). The method of charging did not make much difference to expenditure as a proportion of income for higher-income households. Increasing revenue through raising fixed charges had a greater impact on low-income households than raising variable charges, but both charges resulted in lower-income households paying a larger share of their incomes than higher-income households.[34]

[29] Only 'first round effects' of a policy change could be simulated. Household behaviour changes as a result of the changes in prices and/or incomes could not be captured in this analysis.
[30] This progressive effect is most likely to occur where low-income households own their own homes and therefore directly benefit from reductions in rates. The impact of this price change on low-income renters is more ambiguous and would depend on the extent to which rates reductions are passed through into rental costs.
[31] Sawtooth Economics & Firecone. (2024). 'Simulating the impact of different ways of charging for infrastructure on households'. https://tewaihanga.govt.nz/our-work/key-topics/what-is-fair-providing-and-paying-for-infrastructure
[32] Others such as SuperGold cardholders use public transport but do not pay for it.
[33] Ipsos / Waka Kotahi. (2022). 'RN 009 – Impact of half price public transport fares – a research note'. https://www.nzta.govt.nz/resources/research/notes/009
[34] NZ Infrastructure Commission. (forthcoming). 'Transport pricing and investment: Does how we price infrastructure affect what we need to build?'

5. Achieving our infrastructure goals in ways that can be accepted as fair

Key findings and insights

6. **Funding and pricing are powerful tools for achieving our infrastructure goals, but they also have implications for how the costs of infrastructure are distributed, and what New Zealanders perceive as fair.** Perceptions about fairness are an important factor in whether new and different approaches to paying for infrastructure gain broad public acceptance. Decision-makers should:

   (a) **Use distributional analysis to inform decision-making:** When providing advice to decision-makers, officials should undertake distributional analysis to understand the effect on different households of changing infrastructure charging structures.
   (b) **Not let current opinion about what's fair prevent beneficial policy changes:** People's support for different ways of charging for infrastructure can change – especially once they see the benefits of doing so.
   (c) **Use pricing to guide infrastructure investment and efficient use while also creating a fairer system now and for future generations:** Charges that reflect the costs of providing infrastructure provide the revenue to keep our networks running but also allow households to manage their own infrastructure costs. Good pricing can mean that new investments are better aligned with demand now and for future generations of infrastructure users. Pricing that incentivises more consistent investment in renewals and maintenance leaves assets in a better state for future generations.
   (d) **Find ways to reduce the cost of infrastructure to benefit all New Zealanders – especially those on lower incomes:** Cost savings and efficiencies benefit everyone, but low-income households would benefit the most since they bear the biggest proportionate (relative to income) burden of the costs of infrastructure.

5.1 Some of our current ways of paying for infrastructure make it harder to address current and future challenges

New Zealand faces some difficult choices over infrastructure. We need to meet the needs of a growing population and rising expectations of service quality, maintain and renew our existing assets, build more renewable energy to decarbonise the economy, and make our infrastructure more resilient to natural hazards and a changing climate. All of this needs to happen at a time when there is significant pressure on public finances.

We can't spend or build our way out of these challenges. New Zealand already spends significant amounts on infrastructure, and our investment levels are in line with other developed countries.[35] Funding all the outstanding infrastructure projects across the country would require large increases in taxes, user charges or public debt.

New Zealand will need to respond to the infrastructure challenges we face in smarter ways. This includes properly maintaining our existing assets and networks to get the most service out of them and making

[35] NZ Infrastructure Commission (2021). 'Investment gap or efficiency gap? Benchmarking New Zealand's investment in infrastructure'. https://tewaihanga.govt.nz/our-work/research-insights/investment-gap-or-efficiency-gap-benchmarking-new-zealand-s-investment-in-infrastructure

sure there are enough secure sources of funding to pay for new assets and improvements to existing services to meet the needs of the future. Some of our current ways of paying for infrastructure services make it harder to achieve these goals.

Change is hard. We know that funding and pricing are powerful tools for achieving our infrastructure goals, but they also have implications for how the costs of infrastructure are distributed, and what New Zealanders perceive as fair. We also know that perceptions about what's 'fair' are an important factor in whether new and different approaches to paying for infrastructure gain broad public acceptance and are hence sustainable over time and successive governments.

5.2 What's the way forward?

5.2.1 Use distributional analysis to inform decision-making

Changing pricing mechanisms changes the way charges are distributed across households and this has implications for fairness. When providing advice to decision-makers about changing the way infrastructure services are charged for, officials should undertake distributional analysis to understand the effect of infrastructure charging structures on different households. It is important to understand who will benefit from such a change, and who will bear increased costs. As we found in our analysis,[36] sometimes these impacts can be unexpected or counter to conventional understanding.

Careful distributional analysis helps identify the factors that best target need and the best ways of delivering assistance. Income is not the only driver of infrastructure expenditure and can be a poor proxy for need.

5.2.2 Don't let current opinion about what's fair prevent beneficial policy changes

People's support for different ways of charging for infrastructure can change – especially once they see the benefits of doing so. For example, overseas studies have shown that public acceptance of time-of-use charging on roads is related to experiencing the benefits once it's in place.[37]

It is also notable that no New Zealand local authority that has changed to funding its water services through volumetric charges has gone back to funding through council rates, despite opposition based on concerns about fairness prior to the change.

5.2.3 Use pricing to guide infrastructure investment and efficient use while also creating a fairer system for now and future generations

Fairness is not the only objective sought from infrastructure pricing. While fixed charges can have a stronger impact on lower-income households, they still have an important part to play in ensuring we have reliable and secure infrastructure services. Infrastructure charges that are more closely aligned with the actual costs of providing infrastructure deliver the revenue needed to keep our networks running and better allow households to manage their own infrastructure costs.

Prices also provide important signals for infrastructure investment. Good pricing can mean that new investments are better aligned with demand now and for future generations of infrastructure users.

Pricing that incentivises more consistent investment in renewals and maintenance leaves assets in a better state for future generations. And pricing that incentivises making best use of existing assets

[36] NZ Infrastructure Commission. (2024). 'Understanding how infrastructure charges affect households'. https://tewaihanga.govt.nz/our-work/key-topics/what-is-fair-providing-and-paying-for-infrastructure

[37] WSP. (2018). 'Congestion Charging: Policy and Global Lessons Learned'. https://www.google.com/congestion-charing-policy-and-global-lessons-learned

means less waste, more reliable services and less unnecessary spending that needs to be recouped from all users.

5.2.4 Find ways to reduce the cost of infrastructure to benefit all New Zealanders – especially those on lower incomes

Infrastructure is expensive. Finding cost savings and efficiencies (without compromising quality of service) that can be passed onto New Zealanders in the form of lower prices, taxes, and rates, would benefit all New Zealanders. But the biggest beneficiaries would be low-income households who bear the biggest proportionate (relative to income) burden of the costs of infrastructure.