

The Approach to the Wellington Region Genuine Progress Index (WR-GPI) 2001-2010

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Greater Wellington and all the territorial authorities in the region are partners in the development of the Wellington Region Genuine Progress Index (GPI).



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1. Introduction

The aim of this paper is to describe the approach used to construct a single composite index to measure the well-being of the Wellington region. This is known as the Wellington Region Genuine Progress Index (WR-GPI). This index measures not just the economic but also the social, environmental and cultural aspects of well-being for the region. This composite index is based on a collection of indicators identified as important to representing all aspects of the region's well-being.

The challenge in devising a framework for measuring well-being is to match the multiplicity and dynamism of what constitutes and contributes to people's well-being with what actually gets measured. This may appear to be a relatively simple task, but as developers of GPI's from around the world have discovered, this is not the case. To illustrate this, try to imagine using the count of a single bird species as representing the diversity of the region's fauna. Technically speaking to create a single composite index of the region's well-being is to construct a uni-dimensional scale to represent a multi-dimensional construct of the region's well-being.

Development of the WR-GPI is based on the knowledge that prosperity in the region means more than monetary wealth. It is about ensuring quality of life for all members of society.

The WR-GPI does not claim to be a perfect measure of the region's well-being. However, it aims to be the best possible and through it to develop a better understanding of our real progress by focussing on a range of indicators that span the four aspects of well-being. As our understanding of what is truly important for sustainable development evolves, some indicators within the WR-GPI will emerge as being critical to monitor, while others may become less relevant and new indicators may be needed.

This paper provides some background material on the decision to develop a GPI as a system to measure the region's progress towards well-being; our approach to the development of indicators and indexes of well-being; the selection criteria for indicators; a review of the advantages and disadvantages of developing a single composite index; and finally a description of our approach to developing a single composite index of well-being for the Wellington region.

2. Decision to develop a regional GPI

The Wellington Regional Strategy (WRS) is a sustainable growth strategy that was developed by the region's nine local authorities¹, in conjunction with central government and the region's business, education, research and voluntary sector interests (through a body known as the Wellington Regional Strategy Forum). The WRS brought together a coherent body of regional-scale research to inform decision-making and set a path for the region to grow and make the region internationally competitive.

During the consultation on the development of the WRS, the public said that prosperity in the Wellington region meant more than monetary wealth. They expressed how it was about quality of life for all members of our society and that economic growth should not be sought at the expense of the community or the environment. The WRS Forum agreed that what was needed for the region was quality of life that comes from sustainable economic growth.

As a result, the Forum decided to use a framework that measures our progress across all areas of life. In particular, it would be used to measure our economic, environmental, social and cultural "performance". It was decided that a Genuine Progress Index would be developed to measure the overall well-being of the region.

Following the adoption of the Strategy in 2007, the WRS Office took responsibility for the project and with the support of all the other councils set up a GPI Working Group. The Working Group comprises representatives from each of the region's councils as well as the Ministry of Transport and Capital and Coast District Health Board. After considerable research the Working Group decided that the region's GPI would be based on the nine WRS community outcomes. These outcomes were developed through public consultation to ascertain what people thought was important for the Wellington region. These community outcomes represent the well-being goals of the WRS.

¹ The nine local authorities in the Wellington region include Greater Wellington Regional Council, Kapiti Coast District Council, Porirua City Council, Wellington City Council, Hutt City Council, Upper Hutt City Council, Carterton District Council, Masterton District Council and South Wairarapa District Council.

3. Approach to indicator and index development

It is well known that developing new measures or instrument is a time-consuming task and this is summarised by Fayers and Machin (2007):

“.....don’t develop your own instrument – unless you have to. Wherever possible, consider using or building upon existing instruments. If you must develop a new instrument, be prepared for much hard work over a period of years.”

With this in mind the Working Group began work on the WR-GPI by looking at international approaches to GPI development. The literature is overwhelmingly focused on discussions about the Redefining Progress approach to GPI (Talberth, J.; Cobb, C.; Slattery, N., 2007; Clarke & Lawn, 2008a; 2008b; Neumayer, 2000; Parris & Kates, 2003). Mark Anielski, of the Pembina Institute, refined the US GPI model developing a prototype sustainability accounting system called the Alberta GPI Sustainable Wellbeing Accounting System (Anielski, 2001). However, a more “bottom-up” or community level approach has been developed by GPI Atlantic in Nova Scotia. Publications relating to the Nova Scotia approach are becoming increasingly popular (Colman, 2004).

In 2004 Ron Colman was commissioned by the New Zealand Ministry for Social Development to write a comprehensive report, “The Nova Scotia Genuine Progress Index – Insights for New Zealand”, which recommended next steps New Zealand might take in developing progress indicators (Colman, 2004). In this work Dr Colman noted that:

“As New Zealand’s Local Government Act now mandates regular reporting on social, economic, cultural, and environmental wellbeing at the community level, GPI Atlantic’s Community GPI experience may be particularly relevant to New Zealand circumstances.”

The development of a GPI from a community level is one of three approaches, described in the literature (Michalos et al., 2010; Colman, 2004), to the development of indicators and indexes of well-being. Each approach begins from a different strategic point but never becomes entirely independent of the others. Descriptions of the three approaches follow:

- Top-down: a conceptual framework is constructed describing an understanding of well-being, including its constituents and determinants.
- Bottom-up: the community is engaged or consulted, in order to develop an understanding of what is important to their wellbeing. Available data is then assessed as to what might be relevant to the community’s understanding of well-being.
- Bi-directional: a dual approach is undertaken which involves both constructing a framework and exploring possible indicators of community understanding of well-being.

Based on Ron Colman’s experiences, the Working Group decided that the WR-GPI would be developed using a bottom-up approach that linked into the New Zealand Local Government Act (2002) mandate for community level reporting on economic, social, environmental and cultural aspects of well-being.

Public consultation on the WRS Growth Framework identified nine outcomes that the community identified as important to the quality of life in the Wellington region. These outcomes represent the well-being goals of the WRS and it was decided by the Working Group that they would form the framework of the WR-GPI (see Figure 1). A description of each of the nine outcomes can be found in Appendix 1.

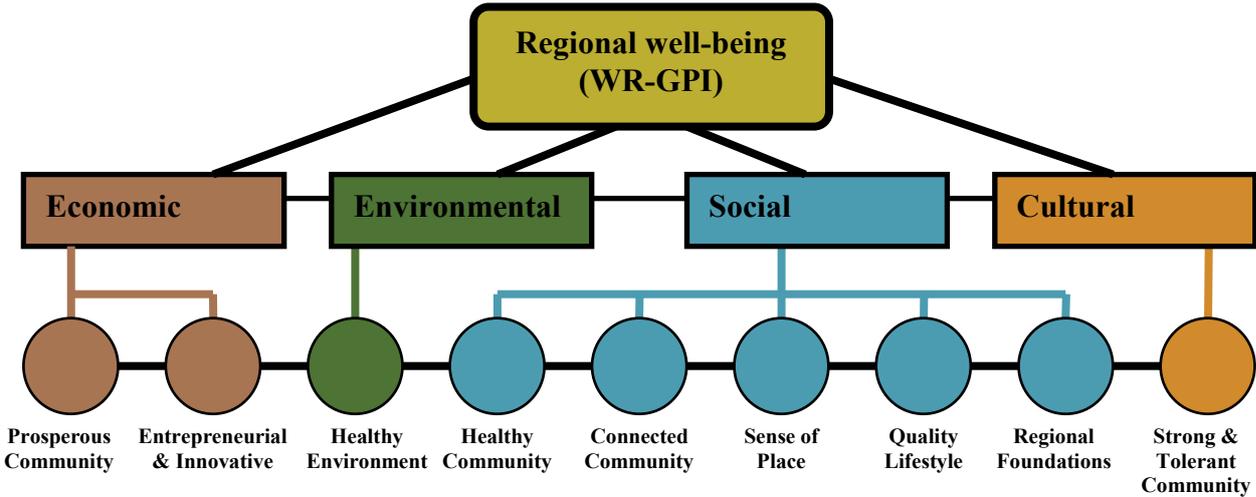


Figure 1: WR-GPI framework

Regional well-being is at the top of the WR-GPI framework and unifies our efforts to measure how the region is progressing. Regional well-being is made up of the four aspects of well-being, which incorporate the nine community outcomes. There is also interaction among all aspects of the framework, although we are far from knowing all the constituents and determinants of these interactions.

4. Indicator and index selection criteria and development

Having adopted a bottom-up approach and developed the WR-GPI framework to reflect what the community values, the Working Group began to draft a list of desirable properties for any acceptable indicator that could be included as a measure of what is valued. After consultation with experts on the draft criteria, it was decided that any acceptable indicator of well-being should be a statistical measure that is:

1. Reliable
2. Valid
3. Repeatable
4. Shows change
5. Easily understandable
6. Can be aggregated or disaggregated
7. Culturally meaningful and relevant
8. Available
9. Cost effective

These criteria were developed by assessing the selection criteria for indicators of other organisations e.g. Ministry of Social Development and Te Puni Kokiri. The criteria helped guide assessments of the use of each indicator.

The Working Group, along with invited experts, embarked on a process of developing and selecting indicators that could be considered as measures of well-being related to what the community considered important to quality of life².

No limits were placed on the number of indicators that could be considered, and after a year of extensive development and consultation³ in mid-2009 a draft list of around 100 indicators for the WR-GPI 2001-2008 framework was agreed upon. Data for the WR-GPI 2001-2008 framework was then collected for those indicators that were available, it was then analysed and a report was drafted. The draft report included the framework, proposed methodologies, indicator data sources, and indexed results for each community outcome area as well as an overall regional well-being.

Over the next year a small sub-group of the Working Group was given the task of communicating the information in the draft WR-GPI report to government policy advisors, academic audiences, health officials and any other interested groups. The goal of this process was two-fold:

² Whilst the community was not specifically involved in the development of the indicators, some public feedback was received during the consultation on the WRS growth framework.

³ During the indicator development period, consultation occurred with the following individuals/groups: WRS Committee, Greater Wellington's Sustainability Committee and Ara Tahī, Greater Wellington councillors, Senior Officers Resource Team (SORT), Wairarapa Combined Councils, Social Development Forum, Wellington Regional Labour Market Governance Group, Capital and Coast District Health Board, Ministry of Transport, Greater Wellington Environment staff, BERL, Canadian GPI expert Ron Colman, Regional Public Health, Centre for Sustainable Cities, University of Otago and Te Wānanga O Raukawa.

- To increase awareness of the language and messages of a GPI; and
- Continue to develop, refine and improve the draft WR-GPI framework indicators and methodologies that will then form the WR-GPI 2001-2010 framework for publication.

This second round of engagement⁴ not only achieved the above two points, but also generated some genuine interest, enthusiasm and support for the work.

At this stage, development of the WR-GPI framework has largely focused on identifying the elements that matter most to the region - the individual indicators - and little is known about the influences and relationships between the elements. The WR-GPI 2001-2010 framework currently includes a total of 86 indicators spanning the nine community outcome areas, under the four aspects of well-being (see Appendix 2 for the full list of indicators, the indicator definition, its influence on well-being and the data sources).

Data for the vast majority of these indicators comes from existing official data sources, or surveys which have been conducted for many years. This has provided us with the confidence that these indicators have been validated in various ways, and therefore measure what they are supposed to measure⁵. There are, however, three indicators included in the framework that currently do not have data sources attributable to them. Whilst these indicators do not fulfil all the selection criteria they have been identified as key to measuring the region's well-being and remain in the framework in case data sources become available in future.

A key limiting factor in the WR-GPI, and other national and international GPIs, is the lack of consistent, longitudinal indicator statistics over the GPI study periods. For the WR-GPI framework the lack of longitudinal data is mainly due to variable data collection cycles over the study period. This results in data gaps for some years over the reporting period and the need to consider data-filling protocols for some indicators to generate longitudinal time-series data for the evaluation of indicator trends.

⁴ Further consultation was carried out with the following individuals/groups: CEO's of Capital and Coast and Hutt Valley DHBs, Social Development Forum, Greater Wellington Environment staff, Peter Glensor, Peter Crampton, University of Otago Public Health, Pacific Institute of Resource Management, and Treasury.

⁵ Whilst the individual indicators within the WR-GPI 2001-2010 framework are themselves valid, we have not assessed the overall validity of the framework at the community outcome, well-being and overall regional level.

5. Advantages/disadvantages of a composite indicator/index

There is much discussion in the literature around the advantages and disadvantages of a composite indicator or index⁶ (Michalos et al., 2010; Saltelli, 2007; Nardo et al., 2005; New Economics Foundation, 2011; Saisana & Cartwright, 2007). The main advantages and disadvantages identified in the literature can be summarised as follows:

Advantages:

- It provides a means of simplifying and summarising complex or multi-dimensional issues.
- It is easier to visually represent and interpret than trying to see trends in many separate indicators.
- It facilitates the task of ranking in benchmarking exercises.
- It can track progress over time on complex issues.
- It can facilitate communication with the community, the media, and decision-makers because a single numerical value is an excellent communications tool.
- It can provide a means of comparing diverse aspects of well-being, on the basis of some common scale of measurement.

Disadvantages:

- It can oversimplify complex issues, which may result in simplistic or misleading conclusions.
- On its own it may have no clear meaning.
- Variations within individual indicators can be buried in composite figures masking real trends in key areas. This includes changes in indicator variables that significantly increase or decrease composite figures.
- It requires all data to be comparable.

Developers of composite indicators/indexes continue to maximise their utility and minimise their misuse, by basing their construction on the best available evidence.

Reflecting on the advantages and disadvantages of composite indicators/indexes, the Working Group decided that composite indexes would be developed for the WR-GPI at the overall regional level, the well-being level and the community outcome area level (refer to Figure 1). It was also decided

⁶ A composite indicator/index is the mathematical combination of individual indicators. With respect to the WR-GPI, composite indexes are formed using a collection of indicators combined to represent specific aspects of the region's well-being.

that, whilst composite indexes make representing, interpreting and communicating results easier, the composite index results should be used in combination with analysis of the individual indicators, to ensure that particular issues, identified as important to the region, are not buried in the composite figures.

6. Our approach to a composite index of well-being

As mentioned earlier, the Working Group decided that composite indexes would be developed for the WR-GPI at the overall regional level, the well-being level⁷ and the community outcome area level⁸ (refer to Figure 1). The construction of composite indexes involves a number of stages where methodological assumptions are made. The assumptions behind our approach to the WR-GPI composite indexes are described below.

Missing values

The ability of a composite index to represent multi-dimensional concepts largely depends on the quality of its component indicators. In some cases the issue of missing data for certain years may complicate matters. There is some missing data for some of the indicators within the WR-GPI framework, mainly due to variable data collection cycles over the study period. This means that data-filling protocols are required to generate longitudinal time-series data for the evaluation of indicator trends and the construction of indexes.

For all indicators with missing data, values have been imputed⁹ using linear interpolations if the data is missing between two real data points. For example, if the first year with real data available was after 2001 (the first year in the framework), the value of the first year with available data was used for previous years. Alternatively, if the last year of real data is before 2010 (the last year in the framework), the most recent value of real data is repeated for all following years up to 2010. These data-filling protocols have been applied across all indicators where there is missing data.

Table 1 shows some examples of indicators where some/all of these data-filling protocols have been applied. Figures in **boldface** are real data points, while those in regular face are imputed values.

Table 1. Application of data-filling protocols to some WR-GPI indicators

Year	Labour force participation rate (%)	Peak AM/PM congestion rates (seconds delay/km travelled)	Percentage of households that spend more than 30% of their disposable income on housing costs (%)	Prevalence of adults participating in regular physical activity (%)
2001	69.4	22.8	25.1	50.3
2002	69.2	22.8	23.3	50.3
2003	68.9	22.8	21.6	50.3
2004	68.7	28.2	19.9	49.2
2005	68.2	30.0	21.9	48.2
2006	68.8	24.9	23.9	47.1
2007	70.4	23.7	25.8	46.1
2008	69.4	28.5	25.9	46.1

⁷ Four indexes: economic well-being, environmental well-being, social well-being and cultural well-being.

⁸ Nine indexes: prosperous community, entrepreneurial and innovative community, healthy environment, connected community, quality lifestyle, sense of place, regional foundations, healthy community and strong and tolerant community.

⁹ "Imputation is the substitution of some value for a missing data point or a missing component of a data point. Once all missing values have been imputed, the dataset can then be analysed using standard techniques for complete data. The analysis should ideally take into account that there is a greater degree of uncertainty than if the imputed values had actually been observed, however, and this generally requires some modification of the standard complete-data analysis methods. Many imputation techniques are available." - Wikipedia

2009	71.5	24.3	26.0	46.1
2010	70.6	28.2	26.0	46.1

Note: data which are not bold were obtained by imputation

While the preference is to have real data to measure what matters most, we believe our data-filling methods are reasonable. We recognise that there is some uncertainty about some of the results and that interpretation of trends needs to be viewed with a small degree of caution.

Normalisation or Indexing

The indicators making up the WR-GPI framework are drawn from a wide variety of data sources and have different measurement units. Normalisation methods can be applied to raw data which allows otherwise incomparable indicators to be compared. It also allows the aggregation of multiple indicators in order to create composite indexes.

A “distance to reference” method has been employed in the WR-GPI framework (OECD, 2008). In this method a benchmark is chosen against which longitudinal raw data are then compared and converted to a numeric well-being score from 0 to 100. This method takes a unique benchmark for each indicator, based on the optimal condition of that indicator over the reporting period¹⁰. For example, an indicator for life expectancy would select the longest life expectancy achieved over the reporting period as the benchmark. All other data points for life expectancy would then be compared with the optimum life expectancy by dividing the actual raw data in any given year by that benchmark. The closer the index score is to 0 the worse the condition of that indicator; conversely, the closer the index score to 100 the better the condition of well-being. A score of 100 suggests the best or optimum condition of well-being over the reporting period. These normalisation procedures have been applied to the raw indicator data of Table 1, and the well-being index scores for these indicators are shown in Table 2.

This approach to normalisation has been used in other GPIs (Michalos et al. 2010; Anielski, 2001) and is ideally suited to the WR-GPI framework as it not only allows each indicator to be assessed for optimal condition in its own right, but it also takes into account the objective of the composite indexes - in which we are continually striving to obtain optimal levels in each composite area. However, there are limitations that need to be noted. Firstly, a judgement must be made in determining the optimal condition for use as a benchmark for each indicator. Secondly, this normalisation approach is based on values (the selected benchmarks) which could be outlying data points and affect the index scores. Thirdly, the replacement of raw data by index scores to enable comparability across indicators is made at the expense of a loss of important information for each indicator. For example, from Table 2 it can be seen that labour force participation is higher towards the end of the reporting period than

¹⁰ In order to standardise the index scores so that increases and decreases uniformly represent improvements or deterioration, respectively, in wellbeing indicators that are:

- positively related to well-being take the maximum raw data value over the reporting period for that indicator as the denominator in the ratio for converting to index scores
- negatively related to well-being take the minimum raw data value over the reporting period for that indicator as the denominator in the ratio for converting to index scores.

at the beginning, indicating some progress has been made, but it fails to indicate anything about the size or adequacy of the participation rate. Clearly, the information contained in Table 1 is at least as important as the information in Table 2. For this reason, it was decided that raw indicator data should also be made available and presented in reports to assist with analysis.

Table 2. Index scores of the WR-GPI indicators shown in Table 1

Year	Labour force participation rate	Peak AM/PM congestion rates	Percentage of households that spend more than 30% of their disposable income on housing costs	Prevalence of adults participating in regular physical activity
2001	97.1	100.0	79.1	100.0
2002	96.8	100.0	85.3	100.0
2003	96.4	100.0	92.0	100.0
2004	96.1	80.9	100.0	97.8
2005	95.4	76.0	90.7	95.8
2006	96.2	91.6	83.2	93.6
2007	98.5	96.2	77.1	91.7
2008	97.1	80.0	76.8	91.7
2009	100.0	93.8	76.5	91.7
2010	98.7	80.9	76.5	91.7

Note: The year that the index score is 100 indicates the best or optimum condition of well-being for each indicator over the current reporting period (2001-2010)

Note: Data which are not bold are based on imputed raw data

Weighting

It is possible to assign different weights to indicators to reflect their importance within any indicator framework. But determining the importance of individual indicators is complicated. Individuals may weight different indicators differently depending on their relationship to a particular field of interest or due to their political leanings.

During indicator development and selection, the Working Group initially labelled indicators as 'priority' or 'secondary' to reflect the importance they thought each indicator reflected within the WR-GPI framework. However, there were no statistical or empirical grounds for assigning an indicator a particular value greater or less than that of other indicators. It was the absence of such grounds that justified the use of an equal weighting methodology to all indicators in the WR-GPI framework. As our understanding of the relationships and interactions among all of the indicators advances, it may become apparent in time that there are sufficient reasons for applying various weightings to indicators.

Aggregation

A simple average or mean score aggregation method has been applied to the index values of indicators in the construction of WR-GPI composite indexes. This is a commonly-used method that can be easily understood. It results in the composite index scale where deteriorations on some indicators can be compensated by improvements in others. A consequence of this aggregation

method is that it may provide a misleading picture if one or a few data points in a set are notably different from others.

7. Full cost-accounting

The WR-GPI framework can easily be updated and is relatively simple to understand and communicate, but it is a framework of indicators with largely unconnected variables. For the WR-GPI to establish linkages between indicators, and to reflect the true philosophy of a GPI, economic valuations of non-market goods and services by full-cost accounting is required (Colman, 2004; Talberth et al., 2007). Development of full-cost accounts will be important if the WR-GPI is to challenge conventional economic directions or significantly reshape progress in the Wellington region.

Full cost accounting is a systematic approach to identifying, summing, and reporting, in an on-going fashion, the full costs - environmental, social, and economic – of particular programs, services or aspects of an economy, over a given time. In addition to obvious and direct costs, full cost accounting aims to include any hidden as well as overhead costs involved.

This system of accounting assigns value to human, social, and natural capital and registers their depreciation or degradation as costs. It is expected that this new system of measuring progress will contribute to policies that shift behaviours toward sustainability and that create a society that nurtures the wellbeing of individuals, families, communities and the natural world.

The methodology and feasibility of undertaking a full cost-account is being developed for the WR-GPI 2001-2010 framework. This report will provide the Working Group, and other interested stakeholders, with an understanding of the complexity of the full-cost accounting procedure. This will provide us with a methodology for assessing the value of undertaking any full-cost accounts in future and how the information may be utilised.

Information on the full-cost account that is being developed as part of the 2001-2010 WR-GPI, the approach to its development, and the results will be described in a future report.

8. Conclusion

The WR-GPI is a new approach to measuring progress in the Wellington region. It is linked to the community outcomes of the WRS and is a reflection of the scope provided by the Local Government Act. The WR-GPI framework measures progress towards outcomes that can play an important role in enhancing the well-being of the region's residents. It aims to track indicators important to well-being¹¹ and make them more accessible to experts, policy makers and the community. This will promote greater awareness of their trends and over time integrate them in a coherent framework that can demonstrate relationships amongst the different indicators.

The WR-GPI does not seek to do away with or replace the regional GDP measure or other market-based measures. GDP provides essential information about changes in the size of the regional economy and of particular economic sectors. However, it is hoped that the WR-GPI will challenge the widespread use of GDP-based measures to act as proxies for societal well-being and progress within the region.

The framework aims to provide far more comprehensive information on the state of the region. It will provide information on how the well-being of the region is tracking over time, it can reveal areas of improvement or strength in the region and can also identify problem areas or issues that need to be addressed. While the WR-GPI can, in time, assist decision-makers to address areas of focus, at this early stage of development, it is essential to focus on ensuring that there is good understanding of the GPI, how it functions and how the full-cost accounting procedure can be useful for assisting decision-making.

¹¹ The framework does not claim to include all measures that are determinants of well-being.

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Appendix 1

Descriptions of the community outcomes of the WR-GPI:

Prosperous Community	All members of our community prosper from a strong and growing economy. A thriving business sector attracts and retains a skilled and productive workforce.
Entrepreneurial & Innovative Region	Innovation, creativity and new endeavours are welcomed and encouraged. Ideas are exchanged across all sectors, resulting in a creative business culture. We have excellent education and research institutions, and benefit from being the seat of government.
Healthy Environment	We have clean water, fresh air and healthy soils. Well functioning and diverse ecosystems make up an environment that can support our needs. Resources are used efficiently. There is minimal waste and pollution.
Healthy Community	Our physical and mental health is protected. Living and working environments are safe, and everyone has access to health care. Every opportunity is taken to recognise and encourage good health.
Connected Community	Our connections and access are efficient, quick and easy – locally, nationally and internationally. Our communication networks, air and sea ports, roads and public transport systems are world class and enable us to link with others, both within and outside the region.
Sense of Place	We have a deep sense of pride in the Wellington region and there is strong community spirit. We value the region's unique characteristics – its rural, urban and harbour landscapes, its climate, its central location, and its capital city.
Quality Lifestyle	Living in the Wellington region is enjoyable, and people feel safe. A variety of healthy and affordable lifestyles can be pursued. Our art, sport, recreation and entertainment scenes are enjoyed by all community members - and attract visitors.
Regional Foundations	High quality and secure infrastructure and services meet our everyday needs. These are developed and maintained to support the sustainable growth of the region, now and in the future.
Strong & Tolerant Community	People are important. All members of our community are empowered to participate in decision-making and to contribute to society. We celebrate diversity and welcome newcomers, while recognising the special role of tangata whenua.

Appendix 2

Table 1. WR-GPI 2001-2010 framework indicators in the economic well-being area

Community outcome area	Indicator number	Indicator name	Website name	Well-being influence*	Data source	Definition
Prosperous Community	PC001	Labour force participation rate	Labour force participation	Positive	Stats NZ Household labour force survey	The total labour force (people who are either employed-working at least one hour per week; or unemployed-not in work but available for work and actively seeking work) expressed as a percentage of the working age population (15 years and over)
	PC002	Unemployment Rate	Unemployment	Negative	Stats NZ Household labour force survey	People (15 years and over) who are not in work but are available for work and actively seeking work expressed as a percentage of the total labour force (people (15 years and over) who are either employed-working at least one hour per week; or unemployed-not in work but available for work and actively seeking work)
	PC003	Percentage of employed residents working and living in the same area	Local employment	Positive	Stats NZ census	Total trips to work from the same area expressed as a percentage of the total number of trips to work in the Wellington region
	PC004	P80/P20 ratio of equivalised gross weekly household income	Equity	Negative	Stats NZ New Zealand income survey-customised request	The ratio of the 80th percentile of equivalised disposable household income to the 20th percentile of equivalised disposable household income, when individuals are ranked by their household incomes
	PC005	Purchasing power (median household income adjusted by CPI)	Income	Positive	Stats NZ New Zealand income survey	Median weekly household income adjusted by the Consumer Price Index (CPI) (a measure of the average price of consumer goods and services purchased by households)
	PC006	Value of household and community work	Value of unpaid work	Positive	Stats NZ (Time use survey) minimum wage	Calculated by multiplying hours spend on unpaid work (including household work, caregiving for household members, purchasing goods and services for own household, and unpaid work outside the home) by the national minimum wage and adjusting by CPI

Community outcome area	Indicator number	Indicator name	Website name	Well-being influence*	Data source	Definition
	PC007	Value of building consents (residential and non-residential)	Building activity	Positive	Stats NZ	The value of new building consents (residential and non-residential) adjusted by CPI
	PC008	Percentage of the working age population with no educational qualifications	Educational qualification of the workforce	Negative	Stats NZ census	The working age population (15 years and over) with no education qualifications expressed as a percentage of the working age population (15 years and over)
Entrepreneurial & Innovative Community	EI001	Percentage of GDP spent on Research & Development	Investment in R&D	Positive	Stats NZ R&D survey	Gross expenditure on research and development in the Wellington region expressed as a percentage of the Wellington region GDP
	EI002	Business start-ups as a percent of business turnover (start-ups and closures)	Business growth	Positive	Stats NZ Business frame	Business start-ups expressed as a percentage of business turnover (start-ups and closures)
	EI003	Percentage of workforce employed in highly skilled occupations (ANZSIC 06 code M)	Highly skilled workforce	Positive	Stats NZ Business frame	People employed in highly skilled occupations (scientific research, architecture, engineering, computer systems design, law, accountancy, advertising, market research, management and other consultancy, veterinary science and professional photography-Stats ANZSIC 06 code M) expressed as a percentage of employed people
	EI004	Percentage of school leavers with NCEA level 2 or above	School leaver qualifications	Positive	Ministry of Education	The total number of school leavers who attained an NCEA level 2 qualification or above as at the time they left school in a given school year expressed as a percentage of the total number of school leavers in a given school year

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Negative influence: increases in numerical values indicate a negative influence (decline) in well-being

Table 2. WR-GPI 2001-2010 framework indicators in the environmental well-being area

Community outcome area	Indicator number	Indicator name	Website name	Well-being influence*	Data source	Definition
Healthy Environment	HE001	Air quality	Air quality	Positive	GWRC Environment	The number of days sampled where PM ₁₀ levels were at excellent or good category levels (<5-16µg/m ³) expressed as a percentage of the total number of days sampled
	HE002	Residents rating of air pollution	Perception of air pollution	Negative	Quality of Life survey	The percentage of respondents in the Wellington region that thought air pollution had been a problem over the last 12 months
	HE003	Fresh water quality for recreation	Fresh water quality	Positive	GWRC Environment	The number of freshwater swimming spots sampled that meet New Zealand's guidelines for recreational water quality on 95-100% of samples expressed as a function of the total number of swimming spots sampled
	HE004	Coastal/marine water quality for recreation	Coastal/marine water quality	Positive	GWRC Environment	The number of coastal swimming spots sampled that meet New Zealand's guidelines for recreational water quality on 95-100% of samples expressed as a function of the total number of swimming spots sampled
	HE005	Groundwater quality	Groundwater quality	Positive	GWRC Environment	The number of groundwater monitoring sites that have median nitrate concentrations in the <0.002-3.0mg/l range expressed as a function of the total number of groundwater sites monitored
	HE006	Stream and river health	River and stream health	Positive	GWRC Environment	The number of monitoring sites which recorded an MCI grade of excellent or good (MCI = 100+) expressed as a function of the total number of monitoring sites
	HE007	Per capita water supply	Water supply	Negative	GWRC-water supply annual report and TAs	The average total water supply per day, for all purposes, divided by the estimated resident population
	HE008	Soil quality of dairy farm sites	Dairy farm soil quality	Positive	GWRC Environment	The number of dairy monitoring sites with no more than one soil quality indicator outside the target range expressed as a function of the total number of dairy monitoring sites
	HE009	Soil quality of drystock sites	Drystock soil quality	Positive	GWRC Environment	The number of drystock monitoring sites with no more than one soil quality indicator outside the target range expressed as a function of the total number of drystock monitoring sites

Community outcome area	Indicator number	Indicator name	Website name	Well-being influence*	Data source	Definition
	HE010	Volume diverted from landfills per capita	Recycling	Positive	GWRC measuring up report	Kilograms of material diverted from landfills for recycling, divided by the estimated resident population
	HE011	Landfill waste per capita	Landfill waste	Negative	GWRC measuring up report	Kilograms of material landfilled, divided by the estimated resident population
	HE012	QEII covenanted areas	QEII covenants	Positive	QEII Trust	The area of registered and approved covenanted land (ha) in the Wellington region
	HE013	Erosion prone land under effective management	Erosion control	Positive	GWRC Environment	The area of erosion prone land under effective management expressed as a percentage of the area of erosion prone land in the region
	HE014	Total Ecological footprint (local hectares per capita)	Ecological footprint	Negative	MFE: Ecological footprints of NZ and its regions	The amount of land (per capita) that is required to sustain the region at current levels
	HE015	Total energy consumption per capita	Energy use	Negative	GWRC regional greenhouse gas emissions inventory tool	The total apparent energy consumption from all sources divided by the estimated resident population
	HE016	Greenhouse gas emissions per capita	Greenhouse gas emissions	Negative	GWRC regional greenhouse gas emissions inventory tool	The net annual emissions of all greenhouse gases divided by the estimated resident population
	HE017	Biodiversity indicator	Biodiversity	N/A	N/A	Needs to be explored to get full region

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Negative influence: increases in numerical values indicate a negative influence (decline) in well-being

Table 3. WR-GPI 2001-2010 framework indicators in the social well-being area

Community outcome area	Indicator number	Indicator name	Website name	Well-being influence*	Data source	Definition
Connected Community	CC001	Peak AM/PM congestion rates	Congestion	Negative	GW AMR/NZTA	The average seconds of delay per kilometre travelled on a sample of Wellington's strategic road networks (Waikanae to Wellington airport; Upper Hutt to Wellington Railway Station; Porirua to Seaview (via SH58); Karori to Island Bay) at peak times of day during the working week
	CC002	Ease of walking around the region	Ease of walking	Positive	GW AMR	The percentage of respondents in the Wellington region that rated getting around the Wellington region by walking as good
	CC003	Ease of cycling around the region	Ease of cycling	Positive	GW AMR	The percentage of respondents in the Wellington region that rated getting around the Wellington region by cycling as good
	CC004	Active mode share of total household travel	Active travel	Positive	MoT TMIF indicator TP005	Walking and cycling share of total trip legs (a surveying unit of non-stop travel by a single mode for a single purpose) by people aged 5 and over resident in a main urban area (population centres of 30,000 people or more)
	CC005	Public transport patronage (ferry, bus, train)	Public transport patronage	Positive	MoT TMIF indicator TV020	The total number of public transport (bus, rail and ferry) boardings divided by the estimated resident population
	CC006	Percentage of people living within 400m of public transport stop	Access to public transport	Positive	GW AMR	The number of people living within 400m (distance measured along the roading network) of a public transport stop with a regular service expressed as a function of the usually resident population count on census night
	CC007	Ease of making a journey across the region by public transport	Ease of using public transport	Positive	GWRC Annual PT satisfaction monitor	The percentage of respondents in the Wellington region that thought that making a journey across the region by public transport is somewhat easy, very easy or extremely easy
	CC008	Percentage of households with access to a motor vehicle	Access to a motor vehicle	Positive	Stats NZ census	The number of households with access to at least one motor vehicle expressed as a function of the total number of households
	CC009	Percentage of households with access to the internet	Home internet access	Positive	Stats NZ census	The number of households with access to the internet expressed as a function of the total number of households

Community outcome area	Indicator number	Indicator name	Website name	Well-being influence*	Data source	Definition
Quality Lifestyle	CC010	Percentage of households with access to broadband	Broadband access	Positive	Stats NZ ICT survey	The number of households with access to broadband expressed as a function of the total number of households
	QL001	Percentage of population living in deprivation	Living in deprivation	Negative	University of Otago: Department of public health	The number of people living in areas rated deciles 8, 9 or 10 (most deprived) on the NZ Deprivation Index (a measure of relative socio-economic deprivation) expressed as a function of the resident population
	QL002	Percentage of households that spend more than 30% of their disposable income on housing	Housing affordability	Negative	Stats NZ: Household economic survey- customised request	The percentage of households that spend more than 30% of their disposable income on housing
	QL003	Percentage of population living in crowded households	Crowded households	Negative	Stats NZ census	The percentage of the population in households requiring at least one additional bedroom
	QL004	Number of households on Housing New Zealand waiting lists	Housing waiting lists	Negative	Housing New Zealand Corporation	The average number of households per year on Housing New Zealand waiting lists
	QL005	Percentage of people that are positive about their quality of life	Perception of quality of life	Positive	Quality of Life survey	The percentage of respondents in the Wellington region that thought their quality of life was good or extremely good
	QL006	Residents rating of their happiness	Self-reported happiness	Positive	Quality of Life survey	The percentage of respondents in the Wellington region that said in general they are happy or very happy
	QL007	Residents satisfaction with work/life balance	Work-life balance	Positive	Quality of Life survey	The percentage of respondents in the Wellington region that feel satisfied or very satisfied with the balance
	QL008	Residents sense of safety (amalgamation of 5 QoL questions)	Sense of safety	Positive	Quality of Life survey	The average percentage of respondents in the Wellington region that felt fairly safe or safe in their home during the day, in their home after dark, walking alone in their neighbourhood after dark, in their city centre during the day or in their city centre after dark
QL009	Recorded offences for crimes against the person- rate per 10,000 people	Crime against people	Negative	Stats NZ recorded offences	The number of recorded crimes in the categories violence, sexual, disorder, family offences, and family offences continued expressed as a rate per 10,000 people	

Community outcome area	Indicator number	Indicator name	Website name	Well-being influence*	Data source	Definition
	QL010	Recorded offences for crimes against property-rate per 10,000 people	Crime against property	Negative	Stats NZ recorded offences	The number of recorded crimes in the categories burglary, car conversion etc, theft, property damage and property abuse expressed as a rate per 10,000 people
	QL011	Ease of access to local parks or other green space	Access to open spaces	Positive	Quality of Life survey	The percentage of respondents in the Wellington region that thought it was easy or very easy to get to a local park or other green space in their city or local area
	QL012	Participation in social activities	Participation in social activities	Positive	Quality of Life survey	The percentage of respondents in the Wellington region that indicated that they participate in to two or more of the following networks/groups: a sports club, a church or spiritual group, a hobby or interest group, a community or voluntary group, a network of people from work or school, gym/walking group, age specific group, or ethnic/cultural group
	QL013	Visitor guest nights	Visitor guest nights	Positive	Stats nz accommodation survey	The number of guest nights, where a guest night is equivalent to one guest spending one night at an establishment, at short-term (less than one month) commercial accommodation providers that have a turnover of at least \$30,000 per annum.
Sense of Place	SP001	Percentage of people that feel a sense of pride in the way their city looks and feels	Sense of pride in city	Positive	Quality of Life survey	The percentage of respondents in the Wellington region that agreed or strongly agreed that they felt a sense of pride in the way their city looks and feels
	SP002	Perception that graffiti, vandalism and litter is a problem	Perception of graffiti, vandalism & litter	Negative	Quality of Life survey	The average percentage of respondents in the Wellington region that thought graffiti, vandalism or litter had been a problem in their local area over the last 12 months
	SP003	Percentage of people who think the Wellington Region is a great place to live	Region as great place to live	N/A	N/A	N/A
	SP004	Residents' sense of community in local neighbourhood	Sense of community	Positive	Quality of Life survey	The percentage of respondents in the Wellington region that agreed or strongly agreed that they felt a sense of community with others in their local neighbourhood

Community outcome area	Indicator number	Indicator name	Website name	Well-being influence*	Data source	Definition
Regional Foundations	SP005	Residents reported contact with friends and family	Contact with friends and family	Positive	MSD social report: Stats NZ general social survey	The percentage of respondents in the Wellington region aged 15 and over who said the amount of contact they have with friends and family who do not live with them is about right
	SP006	Volunteerism rates	Volunteering rates	Positive	Stats NZ census	The number of people indicating that they have done "other help or voluntary work for or through any organisation, group or marae" in the last 4 weeks expressed as a function of the usually resident population aged 15 years and over
	RF001	Water allocation compared to total water resource	Sustainable water use	Negative	Stats NZ; Ministry for the Environment	The ratio between water allocation and total water resource in the region
	RF002	Perception of council services such as water supply, drainage, rubbish collection and roads	Perception of council services	Positive	Stats NZ General social survey customised request	The percentage of respondents in the Wellington region aged 15 and over that were either satisfied or very satisfied about the quality of council services such as water supply, drainage, rubbish collection and roads in their area
	RF003	Perception of road network reliability	Perception of road network reliability	Positive	GWRC transport perceptions survey	The percentage of respondents in the Wellington region that rated the road network as reliable
Healthy Community	RF004	Perception of public transport reliability	Perception of public transport reliability	Positive	GWRC transport perceptions survey	The average percentage of respondents in the Wellington region that rated the bus and train network as reliable
	RF005	Security of electricity supply - number of days with loss of supply	Power outages	N/A	N/A	N/A
	HC001	Prevalence of overweight / obesity	Obesity	Negative	PHIonline NZ Health survey	The age standardised percentage of people aged 15 years and over classified as overweight or obese according to the body mass index
	HC002	Prevalence of hazardous drinking	Risky alcohol consumption	Negative	PHIonline NZ Health survey	The age standardised percentage of people aged 15 years and over reporting a hazardous drinking pattern
	HC003	Prevalence of adults participating in regular physical activity	Physical activity	Positive	PHIonline NZ Health survey	The age standardised percentage of people aged 15 years and over who did 30 minutes of activity a day on 5 or more of the past 7 days

Community outcome area	Indicator number	Indicator name	Website name	Well-being influence*	Data source	Definition
	HC004	Prevalence of smoking	Smoking	Negative	PHIonline NZ Health survey	The age standardised percentage of people aged 15 years and over reporting they have smoked more than 100 cigarettes in lifetime and currently smoke monthly or more
	HC005	Number of reported road injuries per 100,000 population	Road injuries	Negative	NZTA CAS	The number of reported road injuries expressed as a rate per 100,000 people
	HC006	Residents perception of their health	Perception of health	Positive	Quality of Life survey	The percentage of respondents in the Wellington region that rated their health as good, very good or excellent
	HC007	Residents regularly experiencing stress	Stress	Negative	Quality of Life survey	The percentage of respondents in the Wellington region that experienced stress always or most of the time in the past 12 months
	HC008	Expected years of life from birth	Life expectancy	Positive	Stats NZ	The average length of life remaining at birth
	HC009	FTEs for GPs per 100,000 people	Access to primary health care	Positive	Medical council of NZ: medical workforce survey	The number of FTEs for GPs at all work sites expressed as a rate per 100,000 people
	HC010	Avoidable hospital admissions rate per 1,000 people	Avoidable hospital admissions	Negative	MoH Information Directorate customised order	The number of hospital admissions which could have potentially been avoided by timely access to primary health care services or other ambulatory services such as outpatient services expressed as a rate per 1,000 people
	HC011	Amenable mortality rate per 1,000 people	Avoidable deaths	Negative	MoH Information Directorate customised order	The number of deaths which could have potentially been avoided through population-based interventions such as health promotion as well as those responsive to preventative and curative interventions at an individual level expressed as a rate per 1,000 people

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Negative influence: increases in numerical values indicate a negative influence (decline) in well-being

Table 4. WR-GPI 2001-2010 framework indicators in the cultural well-being area

Community outcome area	Indicator number	Indicator name	Website name	Well-being influence*	Data source	Definition
Strong & Tolerant Community	ST001	Residents perceptions of availability of support	Perception of social support	Positive	Quality of Life survey	The percentage of respondents in the Wellington region that thought they had someone to turn to for help if they were faced with a serious illness, injury, or needed emotional support at a difficult time
	ST002	Average voter turnout in local council, DHB and regional council elections	Voter turnout	Positive	DIA Local authority election statistics	The average of regional council, DHB and TLA election voter turnouts where voter turnout is defined as the total number of voters expressed as a function of the total number of possible voters (electors)
	ST003	Perception that the public understands council decision making	Perception of understanding of council decisions	Positive	Quality of Life survey	The percentage of respondents in the Wellington region that agreed or strongly agreed that overall, they understand how my council makes decisions
	ST004	Perception that the public can influence Council decision making	Perception of influence on council decisions	Positive	Quality of Life survey	The percentage of respondents in the Wellington region that thought the public had some influence or a large influence on the decisions the council makes
	ST005	Overall positive perception of cultural diversity	Perception of cultural diversity	Positive	Quality of Life survey	The percentage of respondents in the Wellington region that thought that an increasing number of people with different lifestyles and cultures makes their area a better or much better place to live
	ST006	Percentage of people who can speak Te Reo Māori	Speakers of Te Reo Maori	Positive	Stats NZ census	The number of people indicating that they can have a conversation about everyday things in the Maori language expressed as a function of the usually resident population
	ST007	Percentage of the population identifying with the Maori, Pacific and Asian ethnic groups	Ethnic diversity	Positive	Stats NZ	The number of people identifying with the Maori, Pacific and Asian ethnic groups expressed as a function of the usually resident population
	ST008	Listed and registered heritage places	Heritage places	Positive	NZ historic trust	The number of heritage listings on the New Zealand Historic Places Trust Register

Community outcome area	Indicator number	Indicator name	Website name	Well-being influence*	Data source	Definition
	ST009	Perception of the role of culture and cultural activities in forming a sense of national identity	Perception of role of culture in forming national identity	Positive	Ministry for Culture and Heritage	The percentage of respondents in the Wellington region that believe that culture and cultural activities are very, extremely or critically important to New Zealand's sense of national identity
	ST010	Overall positive perception of a rich and diverse arts scene	Perception of arts scene	Positive	Quality of Life survey	The percentage of respondents in the Wellington region that agree or strongly agree that the area they live in has a culturally rich and diverse arts scene
	ST011	Percentage of people attending arts events	Attendance at arts events	Positive	Creative NZ New Zealanders and the arts survey	The percentage of respondents in the Wellington region, age 15 years and over, that have attended at least one arts event (including visual arts, performing arts, literature, Māori arts and Pacific arts) in the past 12 months
	ST012	Percentage of children enrolled in Te Kohanga Reo and Maori medium schools	Children enrolled in Maori language education	Positive	Ministry of Education	The number of children enrolled in licensed te kohanga reo services and Maori medium education expressed as a function of the total number of enrolments in licensed early childhood services and schools

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Negative influence: increases in numerical values indicate a negative influence (decline) in well-being

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