The Bristol Method

how to measure the sustainability of a city

In it for good
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KPMG’s Sustainability and Cities Centres of Excellence have worked together with stakeholders from around Bristol to produce this module of the Method based on our experience. The case studies themselves are written by those involved in the work. The rest of the paper is written by KPMG based on our insight from helping organisations measure their sustainability for more than 20 years. For further information contact:

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We would also like to thank the contributions from many other groups, without whom this paper wouldn’t have been possible. This includes:

- Mike Zeidler and Sam Wren-Lewis, Happy City Index
- Alex Minshull and Mark Leach, Bristol City Council
- Grant Patterson, International Integrated Reporting Council
Introduction

There have been metrics for cities ever since the first cities were founded and leaders needed to understand what was happening in them. What we have measured has changed over time as the needs of the city leaders and the role of government has changed. These measures have grown in complexity, increased in profile and are used in ever varying ways, particularly as government addresses more social needs. When we measure cities now, we are seeking to understand them in order to manage them better and to provide evidence of performance. We are also increasingly measuring cities to try to understand their future viability and to make decisions that will allow those cities to be happier and healthier in the future.

What we have called the measurement of ‘sustainability’ has also changed over time. It could be argued that sustainability used to be about counting the level of pollution and amount of parkland. In the 1990s in particular that evolved for many cities to taking a new approach to balancing the environmental, social and economic impacts of the city. It included metrics such as energy, water use and pollution but metrics such as crime, employment health etc.

In recent years, this definition has become yet more sophisticated. Now we think of sustainability metrics even more broadly and they include social cohesion, biodiversity, wellbeing, inequality etc. However, the original 1990s concept of balancing still stands as there is a growing recognition of the interdependence of the three and that focussing on environment, economic or social aims to the exclusion of the other two will not guarantee a successful city – and may guarantee an unsuccessful one. But the metrics have been broadened and refined in the intervening decades to reflect the view that.

This module of the Bristol Method shares some of the ways in which cities are being measured and how this could evolve in the future. More importantly though, it provides practical examples of what leading cities are doing, their lessons learned and how these might be applied to other cities.

It also seeks to share how we have set about measuring the impact of our year as European Green Capital.
What do we mean by sustainability measurement?

Sophisticated performance measurements actually link the service outputs to program outcomes. For example, a Fire Rescue Service provides output in support of a Public Safety Program outcome, but a Public Safety Program requires more than the output of a Fire Rescue Service to support its intended outcome. This means we need the ability to measure the impact on the city of multiple activities which support or hinder the same goal.

When all city services are effectively delivering outputs to support all of the city programs, then we are at a sweet spot where quality of life is being maximized for the people living in the city. Quality of life is one measure of the long-term sustainability of the city.

Sustainability is most commonly referred to as:

“meeting the needs of the current generation without compromising the ability of future generations to meet their own needs”.

When put in the context of cities in particular, this makes a lot of sense. Any sustainable city needs to ask how it ensures the citizens in the current city thrive whilst ensuring that the needs of the next generation are met through education, investment in infrastructure, development of culture and community and protection of the environment. This means balancing the burden of taxation now against the need to invest in the development of the city for future generations.

It also means having a clear vision of what the city wants to offer to its current and future residents. We cover this elsewhere in the Bristol Method.

Bristol 2015 has been about creating a happier and healthier city but we have always had a belief that this should be done in a way that encourages behaviours and values that enhance the quality of life of our residents now and in the future. We have sought to encourage responsible behaviours, not excessive, hedonistic ones that create current happiness at the expense of future happiness. Taken at a city level, imagine a city council that strives to lower taxes or spend all our money on items with relatively short term ‘vanity’ benefits such as festivals and ill conceived, sporting events at the expense of investment in employability, skills, legacy infrastructure and green spaces for the future. This would not necessarily create the desired legacy for future generations to come.

When we think of sustainability, it is important to think beyond simply environmental protection. The definition above takes a much broader view which includes:

- **Financial sustainability**
  Many cities around the world are finding they do not have enough funds to provide the programs and services within their mandate – the challenges are many and varied but the relevance to sustainability is whether the city will be able to operate regardless of its environmental track record or best intentions;

- **Social sustainability**
  As cities around the globe become larger mega cities, the question becomes one of whether such populations can live together without increasing social unrest, violence, growing tensions between cultures, growing demands for social supports, etc. This is true whether cities are build incredibly densely or in vast urban sprawls as each comes with specific challenges.

- **Environmental sustainability**
  Just about every resource we use in society is either grown or mined. This means our way of life is dependent on the productive capacity of our land and the resources we have left to extract from the ground (or can recover from our own waste). It is therefore vital for the future viability of cities that we carefully steward these resources;

- **Physiological and psychological sustainability**
  Often considered as part of social sustainability, we need to consider if cities can continue to meet the physiological and psychological needs of their residents. This extends from the provision of basic
needs such as food, shelter and security through to more advanced needs such as a sense of belonging and a chance for 'self actualisation'. The design and layout of our cities is key to this.

This makes sustainability a multi-dimensional concept where all city programmes are achieving excellence and where our generation are passing along to the next generation a city that has all programs in balance. As soon as we tip the balance then we start to run into problems.

A key challenge with sustainability for a city is that sometimes other levels of government also have a mandate for delivering services within these programs. While the city might do its best to achieve a sustainable plan within its program mandate, if other levels of government are not synchronized with such a plan then sustainability can be a real challenge if not impossible to achieve. A quandary indeed!

For example, imagine a city that is delivering public health program services (i.e. nutrition education, immunization, substance abuse prevention, etc.). Additional public health program services may be delivered by provincial and central government departments which can positively or negatively impact the delivery of the city's health services. Another example is in power generation where a city may seek to incentivise the development of public transport and cycling, the national government may seek to subsidise low emission private transport. If the target is pollution reduction then the two are mutually supportive but if the target is the alleviation of congestions then the two do not work together.

So while a city might make every effort to optimize the effectiveness of its services, the indicators for those services might be indirectly affected by other levels of government and that makes it challenging to attribute to one government’s services or another’s. This suggests that the impact of all related services need to be considered systemically.
What is the purpose of measuring city sustainability?

We use data to make decisions. This can include:

- Where to deploy resources
- How to set policy
- Whether to change, start or stop a programme
- What options to give and remove from people
- Where to live, move or work
- How we spend our time and money
- How to form our opinion of something
- Where to lend our support

Different types of data are needed to enable different types of decisions to be made by different stakeholders.

Who looks at the measurements?

- Infrastructure providers
- Residents
- Businesses
- Potential investors
- Potential migrants
- Other cities
- Healthcare providers
- Education providers
- NGO groups

"You need to address why measuring city sustainability is critical - measuring when a city has gone awry and realizing it helps to set a new trajectory that will address sustainability issues. For example, if public safety becomes a real issue - like in Rio de Janeiro - then your efforts should be focused on reducing crime, and the services adjusted to achieve this outcome - otherwise your city might end up with negative consequences that affect other programs and services. The domino effect!

But you also need to look to the future and see where problems may be developing and try to head them off. For example, if long term forecasts suggest more erratic weather patterns, perhaps planning ordinances need to be changed to create more resilience in buildings and infrastructure over the coming decades?"

Alan Mitchell,
KPMG Cities Centre of Excellence
Existing guidelines for measuring cities

Many guidelines already exist for measuring the sustainability of cities. We've summarised some of them below:

1. **Global Compact Cities - Circles of Sustainability**
   - Circles of Sustainability is a method to help urban communities understand how they can be sustainable.
   - It develops a comprehensive profile of the sustainability of an area by scoring the response to questions on economic, ecological, political and cultural ‘domains’. Each of these domains is then broken down further into seven sub domains.
   - For example, economics is broken down into: production and resourcing, exchange and transfer, accounting and regulation, consumption and use, labour and welfare, technology and infrastructure, wealth and distribution.
   - The method has been used by numerous cities, and a profile of their sustainability developed. Some of these cities include Johannesburg, Melbourne, New Delhi, São Paulo and Tehran.
   - The benefit of such an approach is that it considers a range of indicators, and this allows policymakers to understand the impact of their actions across a number social settings. This contrasts with other traditional tools, which are typically focused on one dimension.

2. **Green City Index**
   - The Green City Index is a tool, originally created in 2009, to help cities compare their environmental performance.
   - Over 120 cities from Europe, Latin America, Asia, Africa, US and Canada have had their environmental performance measured to identify their strengths and challenges.
   - The Index uses approximately 30 indicators including CO₂ emissions, energy, buildings, land use, transport, water and sanitation, waste management, air quality and environmental governance. A mix of quantitative and qualitative indicators means the Indices are based on current environmental performance, as well as the city’s intentions to become greener.
   - A summary report documents the key findings from each region, highlighting the best performing cities, comparisons between continents and seven key lessons on how to become a greener city.
   - The benefit of such a measurement is that cities can learn from each other as they debate policies and strategies to minimise their environmental footprint, as well as accommodating population growth, promoting economic opportunity and safeguarding life for urban dwellers today and the generations to come.
How to measure the sustainability of a city

• The Improvement and Efficiency Social Enterprise (IESE) Cities in Motion Strategies is a study that has examined 135 cities, 49 of them capital cities, from 55 countries using publicly available data for the years 2012 and 2013.


• The aim of the report is to create knowledge and develop valuable ideas and innovative tools that can generate smarter cities and promote change at the local level.

• The IESE Cities in Motion Strategies report is intended to be used by all stakeholders in society, including mayors, urban administrators, companies which provide urban solutions and all those interest groups which have the objective of improving the standard of living of cities’ inhabitants.

• The Seattle Initiative, a US organisation, was inspired by the work performed by the government of Bhutan to survey its citizens using a “gross national happiness” index, rather than solely relying on gross domestic product.

• Bhutan surveys its citizens on nine key aspects of happiness: psychological well-being, physical health, time or work-life balance, social vitality and connection, education, arts and culture, environment and nature, good government and material well-being.

• The Seattle initiative, which has been endorsed by Seattle City Council, was the first organisation in the US to develop a set of “objective indicators” to measure happiness.

• These indicators include poverty rate, air emissions, voter turnout, graduation rates, volunteer rates, rates of domestic violence and other crime, life expectancy, commute time, work time, and so on.

• Thousands of Seattle residents have taken part in the survey. The findings allow policy makers to make more effective decisions when serving their communities.
The Council has signed up to the Covenant of Mayors, Compact of Mayors and a number of other reporting schemes but it recognises that there is more that can be done and is currently exploring the benefits and challenges of doing so. These include:

### Benefits of using common guidelines

- Opportunity to compare with other cities
- Comprehensive breakdown of many drivers of sustainability in a city
- Peer and specialist support available
- A chance to meet a defined 'standard'
- Academic research and backup
- Helps us think if we are covering all relevant issues
- A chance to identify possible areas where the city can perform better

### Challenges of using common guidelines

- Many KPIs are irrelevant to Bristol's priorities
- A lot of KPIs which means a lot of time required to participate
- We don't yet gather many of the KPIs
- Most programmes are in the pilot stage and so we have few comparator cities
- Many KPIs will not show change during the next few years as they are macro level rather than the drivers of impacts
- Cost impacts at a time when budgets are being squeezed

In the following case studies, we highlight what we are doing now to focus on measuring our progress against our most important issues. Later in this document we discuss one option for the future measurement of sustainability that we believe provides greater flexibility to meet our needs.
Case Study: Bristol's Quality of Life Survey

The Bristol Quality of Life Survey is an annual survey distributed to up to 29,000 Bristol households. It provides an annual snapshot of the quality of life in Bristol and, having run for 15 years, demonstrates how this changes over time. It also gives local residents an opportunity to voice their opinions about issues close to their hearts and their views on local public services.

The statistics are analysed to a ward level and also by age, gender and ethnic minority etc. A strict coding protocol and rigorous quality checking procedures are applied to the dataset.

The survey outputs are then used by the council, health service and other public sector partners to help plan local services, track change and improve the quality of life in Bristol. The survey is the council's main tool for providing neighbourhood level statistics and public perception information. Sometimes the very differences between “hard” data collected elsewhere in the council such as measuring speed, noise or air quality vs. perception and viewpoints are interesting in and of themselves.

For the 2015 survey, over 29,000 Bristol households have been invited to take part. Nearly 4,000 responses were received for the previous year.

For us, sustainability and quality of life are synonymous. We measure them at five levels to give a comprehensive picture about quality of life in Bristol's neighbourhoods:

1. European common indicators
2. National and regional headline indicators
3. Stakeholder indicators—selected after consultation.
4. Local ward and city-wide indicators—introduced as benchmarks and measured by the local authority.
5. Community group indicators—being developed during 2001/2002 and measured by each group.

The report selects key indicators of widest interest and shows it as maps and trends in a relatively easy to use and comprehensible format. This helps make is accessible.

Professionals and politicians need the public's insight and feedback. The report has significant potential in empowering citizens and Voluntary and Community Sector organisations to both make a case for change. This helps them to effect change themselves and to enable others to do so.

Cities from around Europe and beyond have come to Bristol to find out more about the survey and explore running something similar in their cities.


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Case Study: Happy Cities Index

What is Happy City and the Happy City Index?

Happy City is an initiative that works with a wide range of organisations, from grass roots community groups to the UN and European Union. The initiative works to help communities facilitate sustainable happiness on a city scale.

With ever limited resources, local policymakers need to know what factors are most important for people's well-being, and why. Channelling scarce resources in promotion of these key areas can create knock-on effects that make a lasting difference to people’s lives – and can ensure great impact for less money if well-planned.

As a result, the Happy City Index has been developed to understand, measure and improve well-being.

Rationale: why measure well-being?

There are three main reasons why governments are attempting to measure the well-being of their citizens:

**A common currency**

All major policy sectors have an impact on well-being. However, these sectors often operate independently of each other, despite the potential benefits of working across policy silos. Measures of wellbeing have the potential to unify the development and assessment of policies with a common currency available not only to all policy sectors, but also to community organisations, businesses, groups and individuals across the city.

**Measuring what matters**

Over the past 40 years, the measurement of well-being has developed to such an extent that we can now rigorously monitor the impact of policy areas that have traditionally been thought of as too intangible. This includes measuring the impact of green and social spaces and cultural policy.

**Benefits of well-being**

Higher levels of well-being have been shown to have a positive impact on a number of conditions that we care about. These include improvements in physical and mental health, social and environmental behaviours, productivity and resilience. Promoting well-being should not be seen as a luxury. It needs to be a serious concern of governmental policy.

"GDP alone is not an adequate measure of human prosperity, a more inclusive, equitable and balanced approach is needed."

**UN Declaration**

"The Happy City Index can move us towards a single common measure that every agency, public, private or business, can sign up to and measure its success against. Using this as a common benchmark, we have a powerful tool for joining up public services and driving real public sector reform that can be used all over the country and beyond."

**Paul Taylor Head of Executive Office Bristol City Council**
Methodology: How to measure city well-being – a unique city framework

Well-being is measured using external and internal factors:

- **External factors: The drivers of well-being**
  - The conditions for people and places to thrive

- **Internal factors: Experienced Well-being**
  - How people are feeling and functioning; what they experience and that they do in their day-to-day lives

Happy Cities breaks these down further into a number of domains:

Sourced from www.happy.city.org.uk

**Key lessons: Bristol Pilot**

The Happy City Index is the first city-wide well-being measure in the UK and a pilot study was performed over the city of Bristol. Two different kinds of data – pre-existing data from local and national sources on the “drivers of well-being” and primary survey data on “experienced well-being” were combined.

Bringing together these two types of data meant that the conditions that make a difference to people’s experienced lives across a city could be identified. This allows local policy to be approached from the mindset of improving wellbeing and moves it beyond simply being considered once economic policy objectives have been met. It combines economic and non-economic objectives into a single framework.

Using this approach, both the potential economic and social benefits of wellbeing policy can be identified. Higher well-being is associated with better health, sociality, and higher productivity, while ‘city liveability’ is an increasingly important criterion for companies deciding where to invest.
To reap these benefits, local well-being policy needs to be made across-departmental boundaries and from a long-term perspective. It is not enough to look at the obvious, direct connections between a given policy area and well-being; policymakers need to understand the various pathways through which their work impacts people’s well-being.

**Practical lessons learned in doing this kind of engagement:**

- Collecting representative data for certain demographics proved difficult - young adults (16-24 year olds) and the Black and Minority Ethnic (BME) communities. Extra effort should be taken to ensure a representative sample. In response to this Happy City are developing an online survey, which is considered to be an engaging measurement process, that people can use to better understand the different aspects of their well-being and see how they are doing in comparison to others who have taken the survey. The survey will be shared and target a number of community organisations across the city to ensure that people are reached who would otherwise not participate in the measurement process.

- Policy makers may need to consider different well-being factors when promoting wellbeing in different areas of the city due to varying demographics

- The Bristol pilot was performed on a small-scale in order to show the kinds of ways in which well-being data could inform city decision-making. The main finding was that there are certain key factors that have a much bigger impact on people’s well-being than others, and in identifying these city level factors it can help policymakers set priorities for resource-limited service provision.

With a larger-scale pilot it will be possible to drill down to see that factors that make a difference on a neighbourhood or at street level. This can help determine specific interventions to improve well-being.

For more, visit

www.happycity.org.uk/content/happy-city-index

“Within ten years, wellbeing will be the economy’s headline indicator and our wellbeing will be the fundamental thing we are measuring, with GDP a subsidiary indicator.”

Sir Gus O'Donnell, ex-head of UK civil service
Case Study: Bristol’s Open Data Journey

Cities like Bristol are treasure troves of data. For years, Bristol has been collecting vast amounts of data about every aspect of city life from health to housing to education. Much of this data has typically resided within the walls of City Hall, with occasional edited highlights released as part of a study or Freedom of Information request. But Bristol is challenging this.

Historically, publishing data was quite difficult and much of it was assumed not to be of interest to anyone other than the “experts”. Technology has made publishing data much easier and so cities are publishing much more information in the form of Open Data – data that can be freely accessed, analysed and shared.

Bristol is using smart technologies and digital connectivity to meet the city’s environmental, social and economic challenges and opportunities and become a truly digitally enabled data city. Bristol has been experimenting with the publication of open data in a number of formats over recent years culminating in it developing an Open Data Platform (https://opendata.bristol.gov.uk) with Socrata, an American provider of City Open Data tools. The open data project contains more than 200 data sets that range from demographic data to information on infrastructure, finance and education.

Who is the data for?

Starting with audience, we like to think of four main users of our city data:

1. **Residents**
   - Would like to be able to find out data about the city easily without having to submit a Freedom of Information request. This may be increasingly accessed through apps developed by third parties to serve a specific purpose (e.g. travel applications, theatre bookings, tailored advertising).

2. **Academics**
   - Are often keen to research a particular topic and need data.

3. **Council employees and policymakers**
   - By improving the quality and availability of our own data, we benefit ourselves as employees and policymakers have access to better, more recent data as well as having access to powerful analysis tools. This leads to improved service delivery and decision-making.

4. **Businesses and social enterprises**
   - We believe there is a lot of untapped value in our data. By making it publically available, businesses can access it and make use of it to improve their business proposition. A new ecosystem of app developers is springing up that have the ability to tap in to this raw data and turn it into something that has value to businesses.

Why did we choose to share our data?

Open Data Bristol is a key to opening up access to Bristol’s data in order to make it easier for stakeholders to access, analyse and share information. This will allow new solutions to the city’s problems to be developed and improve transparency.

“Clearly one of the main aims of publishing data is for it to be used. To this end we have focussed our efforts on popular datasets and ensuring that they can be used easily. Popular themes include public transport information, environmental information and information about the public realm (both planning applications and historic buildings). We have opted for using the Open Government Licence when publishing data, which allows for very wide use of the data as we do not want - or consider it realistic - to try to limit what people use Open Data for.”

*Matthew Cockburn, Future City Project Coordinator, Bristol City Council*
How did we make publishing the data easier?

The key has been to make the publication of data as easy as possible. This has been achieved and it is now possible to publish a spreadsheet in just a few clicks and once published a full suite of analysis tools become available. Advice we offer to others:

• Be truly open
  One of the big advantages of Open Data is that it is suitable for the outside world to see so data does not have to be held as securely as other types of data. This has meant we could be more relaxed about where and how the data was stored. However, this does mean that organisations have to have appropriate safeguards in place BEFORE data is published.

• Consider using the cloud
  We opted for a cloud based solution which was fast, robust and secure. A platform was set up in a matter of weeks and maintenance of the services was taken care of by others.

• Choose a flexible system
  Ideally one that can cope with many different data formats and translate it.

• Empower and encourage the data creator to publish it
  They are best placed because they know what it means, what it is and what its limitations are.

• Be clear
  On what can and can’t be published.

• Ensure well documented APIs (Application Programming Interfaces)
  These allow computers to interact directly with your data which makes building apps much easier. It also means that many of your in-house systems can publish data more easily.

What are our next steps?

Bristol has found that it is becoming easier to publish Open Data and that demand for it from a wide range of groups is increasing. We have gone some way to meeting that demand but expect that this will increase substantially as citizens expect data to be more and more accessible.

What are the future plans for the program?

We have started with some of the “low hanging fruit” of the data world (i.e. where the data could be easily accessed and was uncontroversial). As publishing data becomes more mainstream we are working on connecting with some of the “harder to reach” systems, particularly when we think the data is of particular interest (e.g. Freedom of Information requests or fault reporting).

We are organising a range of engagement events to ensure that more people can interact with open data including “hackathons” and more targeted training to provide data skills. At the same time we are working to ensure that data publishers have the skills that are required to allow them to make the most of the new technologies. We are also planning more data journalism to showcase stories based on data.

Developments in real time data are moving fast and we expect to see significant developments in this area over the coming years.

What are our key lessons learned from the process?

Opening up data can be uncomfortable as it opens up information that was not previously open to the public. So, we think that to ensure maximum benefits from Open Data it is important to have high level support for the principle of “open by default”, as well as ensuring that you use good systems. Persistence is also important as opening up data is not always easy and there can be both technical and administrative barriers. However, we think it is worth the effort.
Measuring the Impact of a Programme or Service

Cities measure the sustainability of the totality of the city but they also want to know the impact on the city in terms of specific programmes, services or interventions. For Bristol 2015 in particular, we wanted to consider how being the European Green Capital had made a difference to the city. Led by KPMG, Bristol 2015 and the measurement working group of the Bristol Green Capital Partnership¹, this group included people from academics, business, government and other groups.

In our work considering the impact of any intervention, we have found that it is important to decide on a number of factors. We’ve explained some of them below.

**Input, Output and Impact Measures**

We are increasingly recognising that those who choose KPIs often focus on what matters to the individual programme managers rather than the actual goals of the funders or programme recipients. For example, we may care about how much money is being given to a school, or maybe how many teachers that pays for and what the exam results are but we may shy away from looking at how this affects the children’s wellbeing and prospects.

More often than not, these choices are made because the most important KPIs are not available, not alterable directly by programme management or are seen a subjective. The measurement of the ‘impact’ of a programme is often far more subjective that the direct ‘inputs’ and ‘outputs’ from a programme. The impact KPIs may also require a degree of interpretation and may not emerge until months or years after the management action is taken.

However, we believe it is vital to always consider the various kinds of KPIs:

**Input KPIs**

These are the measures of the resources that go into a service.

For example:
- Budget allocated
- People involved
- Resources deployed
- Time available
- Target market

**Output KPIs**

These are the direct measures of what comes from the deployment of those resources.

Often known as the service management KPIs, they are short-term changes as a result of the inputs.

They include:
- People reached
- Projects implemented
- Change in output
- Change in behaviour

**Impact KPIs**

These are long term KPIs that closely related to the purpose of the activity.

They are the hardest to measure and often least tangible.

Many are not measurable within programme timeframes.

They usually involve changes to wellbeing or performance as a result of behaviour change.

¹For more, see http://bristolgreencapital.org/about/
Pathways of Change and Timeframes

Different stakeholders will be more interested in inputs (e.g. finance departments, politicians), outputs (e.g. programme managers, press) and impacts (e.g. programme beneficiaries, community groups, healthcare and education providers).

When choosing the measures to report, it is important to consider who will want information and when. The nature of modern government means that many stakeholders will want information on the progress of the programme before the real impacts have been felt. This is another reason why we tend to have to make do with output KPIs rather than looking at the ultimate impact of the programme.

For example, a programme to encourage companies to switch to low emission vehicles (LEVs) may look at the number of new LEVs introduced to the city. If it can, the study may also look at how many high emission vehicles (HEVs) were replaced and seek to determine how many of those new LEVs were as a result of the programme itself. What will be more difficult will be measuring and attributing the change in air quality and the reduction in air quality related illness, and the associated cost savings from that reduction in illness.

This could be illustrated as follows:
This is a very simple example of an ‘outcomes pathway’ based on the Theory of Change\(^1\) which is an approach to defining all the building blocks required to bring about a long term goal. The pathway shows how the funding allocated in column 1 (the inputs) allows the programme to operate.

This will have a number of delivery KPIs in column 2 that would normally be considered outputs. Column 3 shows the impact of the example programme, then column 4, 5 and 6 show the subsequent impacts. Each successive column is further from the control of the programme manager and is often harder to demonstrate.

Obtaining reliable data becomes more challenging the further to the right of the outcomes pathway we go but the closer our measurements would be to measuring the desired impact. However it also can get harder to attribute the changes to our programme because of external influences.

There is some overlap between output and impact KPIs because the stakeholders or programme managers may consider what is under their direct control, the amount of resource that can be allocated to measurement and the timeframe over which the programme is measured. The lower the level of control and the shorter the timeframe, the more to the left the chosen KPIs will be.

For example, if the programme was a simple advertising campaign to encourage businesses to purchase LEVs, the output KPIs would be in column 2 (such as the number of programmes) and the impact would be in columns 3 and, potentially 4. However, if the programme was a long term market intervention to provide financial incentives to purchase government supported LEVs then the outputs would be in columns 3 and 4 (as the programme manager has much more control over the number of vehicles purchased and which ones) and the impacts would be on air quality and health.

**KEY MESSAGE:**

When planning what you want to measure for the sustainability of a programme, consider how you measure the impact of your actions, not just the outputs from it.

Where there is limited appetite or resource to measure the ultimate impact, construct the outcomes pathway and find the more measurable KPIs that you know will have a positive impact on the end impact you are looking for.

So when considering how you want to measure sustainability in a city or for a programme, you may want to follow the four step approach below:

1. **Understand what you want to achieve**
   - Prioritise what matters to your city vision and key stakeholders
   - Understand how you can be most impactful with the resources available
   - Determine your timelines

2. **Understand your contribution to the longer term impact**
   - Know your outcomes from your impacts
   - Consider community and business benefits

3. **Focus on the outcomes that help you achieve the impacts you want**
   - Group your activity around what you are trying to achieve
   - Align measurement tools with your resources and chosen metrics

4. **Monitor, adjust and report**
   - Drive the quality of your investment of resources
   - Report your achievements, not just your investment, to those who care and are impacted

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The authors wish to thank the faculties of the University of Bristol and University of the West of England for their contributions on the Bristol Measurement approach.
It is **vital** that the purpose of the data is considered before we even start to gather and present it. In KPMG’s experience, common pitfalls include:

<table>
<thead>
<tr>
<th>Pitfall</th>
<th>Possible solutions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Working with too much data</td>
<td>Understand the purpose by talking to the stakeholders</td>
</tr>
<tr>
<td>Using the data we have, not what is needed</td>
<td>Regularly examine what data is being gathered and if it’s fit for purpose. Know where the data goes instead of just assuming ‘someone uses it because we’ve always gathered it’</td>
</tr>
<tr>
<td>Presenting the data in the wrong units</td>
<td>Per capita, per family, per journey etc is often far more useful than the total, even if it is only an average</td>
</tr>
<tr>
<td>Using data over the wrong timeframe</td>
<td>Many data sets are seasonal or only change over long periods</td>
</tr>
<tr>
<td>Examining data at too high or too low a level</td>
<td>Groups may be interested in the city wide statistics or something much more local</td>
</tr>
<tr>
<td>Drawing incorrect, misleading or biased conclusions on behalf of the stakeholder</td>
<td>Unless specifically asked to do so, it is often best to let the stakeholders come to their own conclusions and always to include appropriate caveats that explain any assumptions that have been made</td>
</tr>
<tr>
<td>Assuming the wrong intelligence level of the users</td>
<td>Sometimes we make poor assumptions about how intelligent/familiar, or not, users are with the data. Knowing how the stakeholder will react and use the data is really important.</td>
</tr>
<tr>
<td>Not having the right level of confidentiality</td>
<td>We should also seek to be as transparent as possible but recognise there may be times we have to be careful. We should always consider what we can release, not assume everything is confidential all the time</td>
</tr>
<tr>
<td>Applying inappropriate averages</td>
<td>Mean, modal and median averages can be powerful tools but sometimes the range and distribution of data points tells the most important story. e.g. on income distribution or equality metrics</td>
</tr>
<tr>
<td>Expecting greater certainty than is possible</td>
<td>Sometimes we want data to be perfect and in doing so we commit an exponentially higher level of resource to get that. We may be able to get better use of the resources by seeking a suitable or ‘good enough’ level of confidence in the data</td>
</tr>
</tbody>
</table>

**What are our top tips**

- Communicate progress to stakeholders including inputs, outputs and impacts
- Be transparent about how reported measures are defined and calculated
- Use a combination of quantitative and qualitative information to tell the story of the activities
- Be transparent about areas for improvement and feed this learning back into all related programmes
- Verify the data and reported information
The future measurement of sustainability

The world of sustainability measurement is evolving rapidly. Lessons learned in reporting in the corporate world are being adapted into the public sector and vice versa. In this paper so far we have talked about the existing work that Bristol and others are doing to measure the sustainability of cities. We have also highlighted some of the benefits and challenges of that approach.

Now we'd like to show you one of the ways we think reporting will develop in the future. This has been developed by the measuring working group for Bristol 2015 including KPMG and members of the Green Capital Partnership Measurement Group.

During 2014 and 2015, a range of stakeholders came together to discuss how we can pool our collective knowledge during 2015 and develop a new and more flexible approach to reporting sustainability. This has provided us with a possible way of measuring the impact of the European Green Capital designation but also a new, more flexible framework and common for looking at the sustainability of a city.

Why did we want to create a new framework?

We reviewed several of the existing approaches to measuring city sustainability. The advantages and disadvantages were highlighted earlier in this paper. Ultimately, we felt that the schemes had advantages but that they were not flexible enough to help us measure how much happier, healthier and more sustainable Bristol had become as a result of being European Green Capital.

Our biggest challenge was that many of the sustainable city measurement frameworks we looked at seemed to take little consideration of the Theory of Change. Almost all of the KPIs measured some of the ultimate impacts of any intervention but these can take years, if not decades to be fully realised from any intervention. We wanted to be able to see the impacts of our Bristol 2015 programme and then understand how they might affect the final impacts so we know we are working on the right activities.

Criteria for selecting a framework

• Credible
• Globally-recognised
• Provides a clear structure
• Can incorporate the Bristol 2015 themes but be independent of them
• Considers every aspect of a city
• Takes account of the Theory of Change
• Ability to be changed and expanded as we learn

Criteria for selecting a measure/KPI

• Are already being measured or can be measured with little extra effort
• Appropriate baselines exist for comparison
• Will move in just a year
• Can be compared with other cities
• Are meaningful to residents and other stakeholders
• Are on the right change pathways
Why we chose the Integrated Reporting Framework

No existing measurement tool for sustainable cities seemed fit for purpose. Instead, the working group chose to use the International Integrated Reporting (IR) framework to assess Bristol’s change in sustainability. Whilst originally developed for reporting in business, the approach is now being extended to government.

Launched in 2010 by the Prince of Wales, the International Integrated Reporting Council (IIRC), the council’s ambition is to create a ‘clear, concise and comparable format’ for measuring sustainability. It was designed to bring consistency to those reporting on sustainability.

IR is increasingly being used by the most progressive organisations who recognise that the long term sustainability of a city or other organisation needs to be considered over the long term and weighed up as part of every major decision. More than 90 businesses are currently piloting this approach but, as far as we are aware, we are the first city that has seriously looked at this and we have been actively sharing our experiences with the IIRC’s public sector pioneer network.

IIRC’s Public Sector Pioneers Network

The International Integrated Reporting Council (IIRC), the leading group developing Integrated Reporting (IR), is a global network made up of various stakeholders. In 2014, the IIRC set up the Public Sector Pioneer Network to develop the practical application of IR in the public realm. It provides organisations with guidance as to how they can apply IR and offers an opportunity to learn from each other through a platform where participants can share their experiences.

From cities to police forces, health services to government departments, the Pioneer Network has already established links in 18 countries. The network has support from the World Bank, the United Nations Development Programme, National Treasuries including those in South Africa and New Zealand and the UK National Health Service.

These organisations are realising that they can use IR to not only help them think of innovative and different ways to operate in an era of austerity, but also to better communicate with their stakeholders.

For more, see www.integratedreporting.org/ir-networks/public-sector-pioneer-network

The IIRC is made up of

• Regulators
• Investors
• Private and public sector companies
• Standard setters
• Accounting profession
• NGOs
The Six Capitals and their application to cities

At the heart of Integrated Reporting is the concept of the six capitals. Put simply, it recognises the fact that for true long term sustainability, we must ensure that we optimise the six types of value that exist in any organisation, grouping or society. It recognises that too often we focus on the economic or financial value at the expense of investing resources in other aspects such as human, natural or intellectual capital. The IR framework encourages us to think about how values can be moved between the various capitals. e.g. We can use economic capital – i.e. money – to pay for new roads or to develop new healthcare solutions that in turn improve human capital (health).

The Six Capitals as applied to Bristol

<table>
<thead>
<tr>
<th>Economic</th>
<th>GDP, tax revenues, jobs, employment, investment etc</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social</td>
<td>Community cohesion, connection, integration, diversity, crime etc</td>
</tr>
<tr>
<td>Natural</td>
<td>Areas of natural beauty, biodiversity, wider ecosystem services etc</td>
</tr>
<tr>
<td>Human</td>
<td>Happiness, wellbeing, education levels etc</td>
</tr>
<tr>
<td>Manufactured</td>
<td>Roads, railways, water infrastructure etc</td>
</tr>
<tr>
<td>Intellectual</td>
<td>Patents registered, students, ideas, common knowledge</td>
</tr>
</tbody>
</table>

What we did:

1. Chose IR and defined what capitals meant to a city
2. Mapped 150+ KPIs from existing standards to 6 capitals
3. Chose those that were of particular interest to Bristol stakeholders
4. Worked with academics to consider indicative, representative behavioral proxy metrics that can be influenced and will change in a year
5. Categorized the chosen metrics by availability of data
6. Also developed intervention/project level metrics against relevant capitals so we could infer contribution to macro level changes through interventions

The flexibility of the IR framework allows us to look across the various capitals, choose suitable KPIs from the best of the tools we reviewed and then look at the change pathways required for those KPIs. We can then decide on the behavioural change we want to encourage during the year and measure that. We can infer that encouraging the right behaviours amongst our residents and businesses will give us positive outcomes for the broader sustainability of the city in the long run.

The table on the following page shows the definitions the working group recommended for Bristol, what our objective was as European Green Capital and the KPIs we decided would be the right indicators. We have also shown the results of our work to assess whether that data is available and where it may come from (e.g. QOL = Quality of life survey).
**How to measure the sustainability of a city**

Published: October 2015

Version 1

At the time of writing of this paper, Bristol 2015 and Bristol City Council are looking to see how they can gather together this data and provide it to the stakeholders in an effective manner, building on projects such as the Open Data Bristol work.

<table>
<thead>
<tr>
<th>Capital Definition for Bristol 2015</th>
<th>ECONOMIC</th>
<th>SOCIAL</th>
<th>NATURE</th>
<th>HUMAN</th>
<th>MANUFACTURED</th>
<th>INTELLECTUAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>The economic vibrancy of the city beyond GVA/GDP, particularly the green sector</td>
<td>The extent to which people feel connected to each other and a part of the city</td>
<td>Ability of the natural environment of the city to meet our needs for goods and services</td>
<td>People’s knowledge, skills and sustainable attitudes</td>
<td>Physical objects built to allow the city to function effectively</td>
<td>Intangibles that provide a competitive advantage e.g. IP and reputation</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Measures</th>
<th>Positive impact on local economy</th>
<th>Positive impact on community cohesion</th>
<th>Positive impact on people’s connection to nature</th>
<th>Positive impact on sustainable lifestyle</th>
<th>Positive impact on behaviours enabled by infrastructure</th>
<th>Positive impact on Bristol’s reputation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Investment in greentech (Invest Bristol &amp; Bath may be able to provide)</td>
<td>% agree “How often do you...get involved in work for voluntary or charitable organisations” (HCI)</td>
<td>“How often have you volunteered to help out a charity or your local community in the last 12 months?” (QOL)</td>
<td>% agree “How often do you spend your leisure time outdoors (e.g. in your garden or local park or in the countryside)” (HCI)</td>
<td>% visited parks and green spaces at least twice a month (QOL)</td>
<td>% concerned about climate change in the UK (QOL)</td>
<td>% journeys to work not by car (QOL)</td>
</tr>
<tr>
<td>Usage of Bristol2C (B2C team CIC may be able to provide)</td>
<td>% agree they belong to neighbourhood (QOL)</td>
<td>% agree this person is like them: “This person believes that people should care for nature. Looking after the environment is important to them.” (HCI)</td>
<td>% changed the way they travel due to climate change concerns (QOL)</td>
<td>% of residents and businesses who have invested in energy efficiency (Warm Up Bristol may be able to provide)</td>
<td>Perception of Bristol on the world stage / Bristol’s profile (Destination Bristol may be able to provide)</td>
<td></td>
</tr>
<tr>
<td>Increase in tourism attributed to 2015 (Destination Bristol may be able to provide)</td>
<td>% agree during last 2 weeks “I have been feeling close to other people” (HCI)</td>
<td>% reduced household waste due to climate change concerns (QOL)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Key**

- Data source confirmed
- Exploring with likely source
- Data source unknown

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**At the time of writing of this paper, Bristol 2015 and Bristol City Council are looking to see how they can gather together this data and provide it to the stakeholders in an effective manner, building on projects such as the Open Data Bristol work.**
KPMG Viewpoint

What is my city worth?
Ben Wielgus

What is your local park, library, bridge or swimming pool worth? We can easily put a figure on it the value of the land or the buildings but that number in pounds and pence can never truly reflect the long-term return that asset provides to a city. Cities need to factor in a much wider set of measures to make an informed judgement as they make difficult decisions about where to allocate their increasingly scarce resources.

It is an especially live issue as cities continue to cope with the budgetary blow dealt by the financial crisis. Disbursements from central government are generally lower, as is the tax take from hard-pressed business. Simultaneously demands on welfare services have grown. From Sydney to Shanghai via Swansea, cities have to do more with less.

Under this pressure, it would be easy to put more value on infrastructure that generates economic growth. That could be a mistake. New factories could create economic growth. However, if those factories polluted the water supply, their effect on the population’s health and wellbeing, and the pollution of natural resources would cause economic harm.

I contributed to KPMG’s New Vision of Value report in 2014, which highlighted the need for a broader measurement system for business and this thinking is even more relevant to cities since they operate within a defined geographical area.

Whilst working in Bristol during its year of European Green Capital, KPMG has taken the six capitals of the International Integrated Reporting Council and our True Value approach to consider how cities can more consistently measure the value of city services and assets. I think considering these six capitals can help cities consider the far broader contribution of their assets to the long-term viability and wellbeing of a city.

The six areas of capital are:

- **Economic capital**: the earnings of business and individuals across the city
- **Manufactured capital**: the value of the constructed physical assets of the city including roads, buildings, vehicles, dams etc.
- **Human capital**: the health and wellbeing of citizens
- **Social capital**: the strength and effectiveness of the relationships within the city including families, communities, business and the perception of the city by others (e.g. tourists)
- **Intellectual capital**: the cumulative know-how and collective skills of the city
- **Environmental capital**: the natural resources that benefit the city, or negatively the costs imposed by carbon emissions and other pollution.

Measuring value in this way lays bare how services that look like costs could in fact generate a long-term value elsewhere. It also gives us a way of thinking that helps us recognise that we can often create value by optimising the trade-offs between capitals instead of focussing on one or two at the expense, or without thought, of others.

For example, a library, many of which have been forced to close in cities in recent years, creates intellectual capital through access to learning materials and information. It improves local people’s job prospects and increases a city’s social capital by providing a venue where isolated older people can enjoy human contact, children attend playgroups or people feel a boost simply by meeting friends for a coffee.

Closing that library would generate a short-term cost saving but could have an extremely detrimental effect on the longer-term cohesion of the community and the skills of the local workforce.

The majority of the existing measurements focus too heavily on output indicators, like the number of buses, libraries or schoolbooks you get for your money. It is considerably harder to measure the impact of that investment, as that could take years to filter through the system. However, if we truly want our decisions to be long term then I believe we really must start to factor this in much more.

By measuring the true value of each aspect of a city’s capital, we can have an evidenced-based discussion about which areas really create value for that city and its people. Linking the beneficiaries of the True Value of a service or asset with its funding can create a fairer system of funding city infrastructure.

Ben Wielgus, Associate Director, KPMG
Ben.wielgus@kpmg.co.uk
What are the next steps beyond this?

We now have what we believe is one of the leading frameworks for thinking about the long-term sustainability for a city. It allows us to think about how we transfer ‘value’ between the six capitals to ensure we optimise the most important aspects.

KPMG is currently working on a further extension to this which merges together a number of approaches that have already been applied to the public sector:

**Municipal Reference Model**
This provides a consistent framework for looking at all of the services/activities within a city, whether they are provided by the city government, the private sector or by others. This includes justice, education, parks, water, power, communications, culture etc. This is important because it allows comparability with other cities and stakeholders where the various services may be provided by a very different mix of city, state, private and third sector organisations.

**Integrated Reporting Framework**
Building on the work in Bristol, this provides a framework for referring to the positive and negative contributions to each capital by any given city activity.

**KPMG’s True Value methodology**
KPMG’s True Value\(^1\) approach recognises that we need to move beyond the focus on economic valuation but that it is far easier to compare the six capitals when they are in the same ‘measure’. Using a wide range of sources, the approach takes chosen measures from the most important capitals and converts them into financial values so that it is easy to compare actions across all six capitals. For example, we take studies on the value of every square km of parks in a city and use that to provide a return on investment for a city’s parks service so that that can be compared against other spend.

The diagram below shows a sample of how the various aspects of a city might link with the IIRC’s framework and where some of the True Value may lay. This is right at the forefront of city measurement and cities are currently being sought to pilot the approach. The work has already been carried out for various national infrastructure operations such as long distance rail and telecommunications.

\(^1\) For more information, go to www.kpmg.com/truevalue

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**MRM**
Describes the various activities / functions a city performs / requires

**IIRC**
Gives a recognised framework to categorise the values created and destroyed

**True Value**
Gives us a method and IP to calculate the relevant values

This approach is rapidly gaining attention from policy makers and city governments and we’d welcome any city that would like to talk about it further.
Where do you go from here?

This module has shared examples of what others are doing in measuring the sustainability of the city. It is almost certain that every city in the world has some form of data collection that includes metrics on sustainability, although it may not be called such.

From the experiences of Bristol and others involved in this project, we have put together some key questions we recommend any city asks itself when considering the next steps.

Questions to ask yourself when considering measurement of sustainability

- Why am I measuring? What are the impacts I want to achieve?
- Who else is going to want to know the results of measurement? Can I speak with them? What do they want to know/how will they use the data?
- How long can I wait for the answer? Where on the change pathway do I stop?
- What level of certainty am I looking for?
- Who can I work with on this?
- Do I want to measure behaviour as outcome or end results as impacts?
- What data already exists?
ABOUT BRISTOL 2015

European Green Capital is a prestigious annual award designed to promote and reward the efforts of cities to improve the environment. Bristol is the first ever UK city to win the award.

European Green Capital is run by The European Commission, recognising that Europe’s urban societies face many environmental challenges – and that sustainable, low-carbon living is vital to the future of our cities and our people.

The award was first won by Stockholm in 2010. Since then, Hamburg, Vitoria-Gasteiz, Nantes and Copenhagen have carried the torch. Bristol will hand over to Ljubljana at the end of the year.

ABOUT KPMG

KPMG LLP, a UK limited liability partnership, operates from 22 offices across the UK with over 11,000 partners and staff. KPMG is a global network of professional firms providing Audit, Tax, and Advisory services. We operate in 155 countries and have more than 162,000 people working in member firms around the world. Our vision is simple - to turn knowledge into value for the benefit of our clients, people and our capital markets. Our innovative spirit inspires what we do and how we do it, providing valuable benefits for clients, employees and stakeholders. Constantly striving to be better lies at the heart of what makes us different.

KPMG member firms’ sustainability and cities teams employ hundreds of people around the world who help business, government and society consider the opportunities and the risks emerging in our changing world. We help them ensure we have a more sustainable future.

ABOUT THE HAPPY CITY INDEX

Happy City exists to demonstrate that being happier needn’t cost the earth. The world needs a new story: less ‘stuff for stuff’s sake’ and more ‘life for life’s sake’. A story that redefines what it means to prosper. We believe that story is unfolding all around us.

Ours is a radically simple plan to grow happiness – one city at a time - by helping people **LIVE MORE, SHARE MORE, and ENJOY LIFE, FOR LESS**. Happy City is a sophisticated project, working at all levels, from the grass roots of small community groups to the high table of national strategists. Activities include campaigning & communication, projects, training, events and the development of better measures of prosperity. Each element supports the others – anything less simply won’t work.

**Disclaimer:** The information contained in this module of the Bristol Method is general in nature and is not intended to address specific circumstances of another city or business.

THE BRISTOL METHOD

The Bristol Method is a knowledge-transfer programme aimed at helping people in other cities understand and apply the lessons that Bristol has learned in becoming a more sustainable city, not just in 2015 but in the last decade.

Each module of the Bristol Method is presented as an easy-to-digest ‘how to’ guide on a particular topic, which use Bristol’s experiences as a case study. The modules contain generic advice and recommendations that each reader can tailor to their own circumstances.

The Bristol Method modules are published on the Bristol 2015 website at [www.bristol2015.co.uk/method](http://www.bristol2015.co.uk/method)

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