

The Air that we Breathe

A Playbook
for the Urban
Post Pandemic
Environment

Executive Summary

Covid-19 has made an **unparalleled impact upon the world**

By late September, deaths were reported at [1,003,497¹](#). Countries have fallen into deep economic recessions. To date, the UK's economy has suffered the deepest recession among the world's major economies, shrinking by over 20 percent in the second quarter this year. Unemployment has exceeded the high of the 2009 global economic crisis and deprivation has become more pronounced. Many countries are also now grappling with the risk of a 'second wave' of the virus as the rate of transmission and positive cases increase. Our cities are on the frontline of the pandemic crisis and have felt the impact more than anywhere else but they have also provided an insight into the potential for change. As over 100 countries implemented lockdowns, pollution took a dramatic downturn, congestion dropped, and new, more sustainable ways of working emerged.

Governments' economic response to the crisis has been unprecedented: globally, [\\$10 trillion](#) in stimulus packages were announced in the first two months. While governments and companies continue to provide much-needed crisis relief, many are also starting to look for ways to reinvigorate their economies and kick-start the recovery process. This provides a unique opportunity for cities to make a departure from business as usual and set in place robust, sustainable, and transformative recovery strategies.

To enable recovery, broad-based fiscal stimulus and investment will be required: jobs need to be created and new areas of growth identified. However, this needs to be balanced with the state of city coffers. According to the UK's Local Government Association, local authorities are expected to experience a funding shortfall of up to [£10 billion](#) due to high pressure on expenditure and reduced revenues.

¹ Globally, as of 30 September 2020, reported to WHO.

Now, more than ever, city leaders need to maximise their growth potential and be confident that the strategies and solutions they apply have a high and measurable return on investment.

For too long it has been a widely-held belief that pursuing a sustainability agenda requires greater investment for a reduced return. This paper seeks to flip this notion on its head and make the case for a post-pandemic sustainable economic recovery, and, crucially, will also outline a playbook of solutions cities can implement. While rebalancing the environment will require substantial financial investment, it also has the potential to deliver gains that far exceed the initial capital outlay, both in the short and longer term. There is mounting evidence that implementing green, sustainable solutions have the potential to deliver savings and a high return on investment, while providing better social, environmental and public health outcomes.

Making this choice is also fundamental to tackle this generation's biggest challenges. Investing in a sustainable recovery can provide the required economic engine for growth without amplifying air pollution and exacerbating climate change. We are rapidly approaching the climate change 'danger line' of a 2 degrees Celsius temperature increase. The emissions fuelling climate change are also fuelling a public health crisis. Globally, air pollution is already responsible for up to 7 million premature deaths every year. There is also [growing evidence](#) linking exposure to air pollution to an increased risk of death from Covid-19, leading to calls to keep air pollution low to help manage the rate of infection.

This paper starts by outlining the socio-economic impact of the pandemic on our cities and makes the case for cities to adopt a new playbook for sustainable recovery. The paper sets out 3 pillars that should form a key part of cities' sustainable economic recovery strategies: **building green infrastructure**, upgrading **the energy efficiency of homes and workplaces** and enabling **further digitalisation and changing lifestyles**. Investment in these three pillars has the potential to create jobs and spur economic growth, while safeguarding public health and the environment.

The choices cities make now will determine the pace of economic recovery, as well as the health and resilience of their citizens and the environment. During previous economic crises, such as the 2009 financial crisis, [several countries and municipalities](#) created 'brown' stimulus packages focused on building more fossil fuel generated power plants, building and upgrading roads and investing in industries such as automobile manufacturing. Following the same path would be a missed opportunity. The governments that choose to implement a sustainable post-pandemic recovery will become the **benchmark for cities of the future**, reaping the gains of early investment through a stronger economy and a healthier society.

Key messages

- There is an economic and financial case for implementing a sustainable post-pandemic recovery. For too long it has been a widely-held belief that pursuing a sustainability agenda requires greater investment for a reduced return. Implementing green and sustainable solutions can deliver short and longer term returns on investment, while providing better public health, social and environmental outcomes.
- A study conducted by The International Renewable Energy Association (IRENA) found that if countries choose a transformative energy pathway, based largely on renewable sources of energy and steadily improved efficiency, it would effectively pay for itself, bringing between a \$3-8 dollar return on every \$1 spent.
- The global economic response to pandemic management and relief has been unprecedented. Similar weight and investment will need to be thrown behind the long term recovery. This provides a unique opportunity for city leaders and industry to make a departure from 'business as usual' and set in place robust, sustainable and transformative recovery strategies.
- Investing in green infrastructure projects, including sustainable transport, urban greening and renewable energy, can provide the necessary economic stimulus to reinvigorate economies and create jobs. If designed and implemented using digital twin technology, cost savings and efficiency gains could be even greater.
- Upgrading the energy efficiency of homes and workplaces can yield an economic return double the size of the initial investment. Covid-19 has signalled a significant shift in the way we use commercial real estate (CRE). Attention is already focused on how CRE can be re-purposed. Any retrofit of CRE should include energy efficiency updates to lock in long term economic savings and emission reductions.
- During Covid-19 lockdowns, more sustainable behaviours emerged in cities, including reduced travel, remote working and the use of digital tools to access services and goods. In order to support the continuation of these behaviours and unlock the potential economic growth in this sector, city leaders will need to invest in their digital infrastructure.
- Green and sustainable bonds are an important avenue of financing that governments should leverage to support a sustainable economic recovery. There has been rapid growth in the supply of sustainability-linked bonds in recent years to fund green and social projects in urban areas.
- Governments should consider applying Environmental Social Governance tools and principles to select and measure the outcome of their investments, with a view to maximise impact, enable accountability and drive data-driven decision making.

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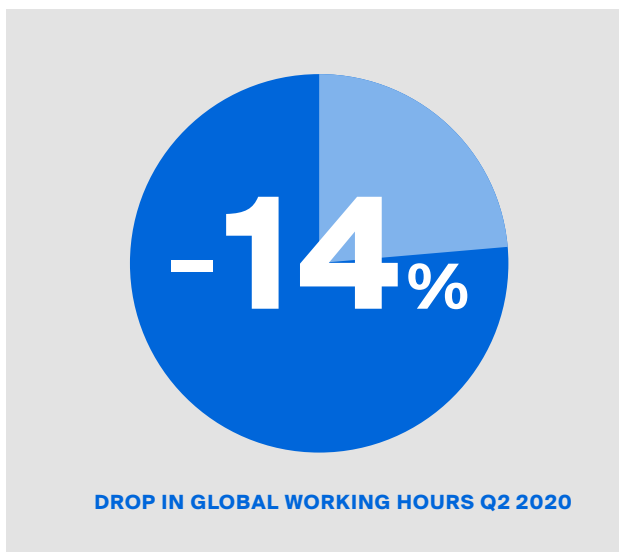
Introduction

Covid-19 has Changed the World and our Cities are at the Forefront of the Crisis

Covid-19 has sent shock waves across the world. Since the strain was first detected in December 2019, over 33.3 million cases and [1,003,497 deaths](#) have been reported by mid-September. The health crisis quickly turned into a major socio-economic crisis. The necessary lockdown measures introduced by [over 100 governments](#) effectively slowed the spread of the virus but have also triggered the most severe economic shock in nearly a century. The severity of the ongoing crisis comes into focus when compared with the 2009 global fiscal crisis. In 2009, the global GDP fell by only 0.1%. In 2020, the IMF predicts that global GDP will fall by [4.9%](#). Among the world's major economies, the UK has suffered the deepest recession, with GDP shrinking by over 20 percent in the second quarter this year.

The extent and speed with which global economies will rebound remains uncertain. The pandemic has also led to a dramatic surge in unemployment. The ILO recorded a [14% drop](#) in global working hours during the second quarter of 2020, equivalent to a loss of 300 million full-time jobs. As is often the case in crises, the people and places with the lowest incomes are being the hardest hit. Evidence suggests that [young people and women's jobs](#) are those most at risk. In the UK, the number of employees on UK payrolls has dropped by three quarters of a million since the start of the lockdown, not accounting for the impact on self-employed and informal workers. So far, the consequences for the UK workforce have been significantly mitigated by temporary Government support schemes, such as the Job Retention Scheme. As these unwind, the Bank of England projects that unemployment will hit [2.5 million](#) by the end of the year.

Our cities are on the frontline of the Covid-19 crisis. The raison d'être of cities – density, dynamism, global connectivity, commerce – is what has made them most vulnerable to the spread and socio-economic impact of the pandemic. It is too early to measure the overall impact on cities but preliminary data shows that urban areas are experiencing sharp downward trends in GDP and employment. Cities are also experiencing significant drops in local revenues, particularly those with budgets that rely on tourism, sales tax and higher proportions of national funding. In London, Mayor Sadiq Khan has announced that London faces a forecast budget shortfall of [£493 million](#) over the next two years, while, across the Atlantic, in Washington DC, Mayor Muriel Bowser reported a [\\$1.5 billion](#) revenue gap for the same period.



The pandemic has also highlighted and exacerbated existing challenges within cities – and brought new ones. Before the pandemic hit, many cities were already grappling with pervasive challenges, such as maintaining ageing infrastructure, tackling growing inequality, ensuring adequate housing for their citizens and environmental degradation.

Covid-19 brought these issues into sharp relief. However, cities have also provided an insight into the potential for change. As a result of lockdowns, pollution took a dramatic downturn, congestion dropped, and new, more sustainable ways of working emerged.

THE CURRENT AND PROJECTED ECONOMIC IMPACT OF COVID-19 ON CITIES

PARIS	Economic activity decreased by 37% since mid-March, in contrast to 34% nationally. It is estimated that the crisis will cost Paris 400 million Euros.
BARCELONA	Estimates show a 14% drop of GDP, which is 4 times higher than that of the 2009 financial crisis.
AMSTERDAM	The economic fallout is estimated at 1.6 billion Euros per month. If the crisis continues, a 1.5-2.8% decrease in growth is expected.
UK CORE CITIES	Estimates indicate that the crisis had incurred costs for amounting to 1.6 billion among these cities alone by May 2020.
LONDON	London faces a forecast budget shortfall of £493m over the next two years.
MADRID	Estimates indicate that after two months of confinement, the city of Madrid would lose 60,500 direct jobs, or an estimated 108,000 if counting indirect employment. This represents 5.4% of employment.
BOGOTA	After two months of confinement, Bogota's GDP was estimated to have fallen by around 4% and unemployment reached 18%.
WASHINGTON DC	The estimated impacts of confinement have resulted in 70,000 workers filing for unemployment and creating \$700m revenue gap.
SAN FRANCISCO	San Francisco has seen 5,676 employees being laid off. Deficits for the upcoming two-year budget are estimated to be between \$1.1 and \$1.7 billion due to revenue shortfalls

A Silver Lining?

As a result of global lockdowns, many cities witnessed a substantial drop in the levels of air pollutants and warming gases. In the first few weeks of lockdown, levels of CO₂ emissions in London reduced by almost 60% and NO₂ levels, a pollutant mostly produced by diesel vehicles, dropped by 30%. Meanwhile, in the Northern Indian State of Punjab, as air pollution dropped, people were able to see the Himalayas for the first time in decades.

This sudden improvement in air quality was seen by many as the silver lining of the pandemic. While the social and environmental benefit of this reduction is clear, there are wider reaching implications. As the pandemic spread, [evidence has grown](#) linking exposure to air pollution to an increased risk of death from Covid-19. Further, air pollution is also a major economic disruptor – according to a report published by Public Health England, the cost of air pollution to the NHS and social care in England could reach as much as [£5.3 billion](#) by 2035 unless action is taken.

However, as lockdowns are lifted, and global trade and travel increase, data indicates that air pollution is rebounding. In China, air pollution has returned to pre-pandemic levels. [Scientists](#) say Europe may follow a similar trajectory. In many ways, this is not a surprise. Emission reductions caused by economic downturns tend to be [temporary](#) and can even lead to a growth in GHG emission as countries and cities attempt to recover.

While the drop in air pollution experienced during lockdowns has not been sustained, there is still cause for optimism. The enforced changes implemented during lockdown provided an insight into the potential for change. Take, for example, the large swathes of the population effectively teleworking and the number of people cycling in cities booming. If supported effectively by governments, many of the more sustainable behavioural changes taken up by necessity can endure beyond the life-span of the pandemic.

“Coronavirus won’t fix climate change. But how we respond will make a big difference.”

ARCTIC TODAY, 2020

Making the Case for a Sustainable Post-Pandemic Recovery

Governments’ economic response to the crisis has been unprecedented: globally, [\\$10 trillion](#) in stimulus packages were announced in the first two months. While governments and companies continue to provide much-needed crisis relief, many are also starting to look for ways to reinvigorate their economies. Similar weight and investment will need to be thrown behind the long-term recovery process. Many cities have set up task forces to develop recovery visions or plans including investment in infrastructure, urban regeneration, and financial assistance for their citizens. This provides a unique window of opportunity for city leaders and industry to set in place robust, sustainable and transformative recovery strategies.

The challenge will be to ensure these recovery plans and stimulus packages do not re-enforce the status-quo, and that they build upon some of the more sustainable behaviour changes adopted through necessity during the crisis. During previous economic crises, such as the 2009 financial crisis, [several countries and municipalities](#) created stimulus packages focused on “shovel ready” infrastructure projects to spur economic growth and job creation. In many cases, this included building more fossil fuel generated power plants, building and upgrading roads and investing in industries such as automobile manufacturing.

“The failure to respond to the last recession by scaling up investment to meet climate targets was a missed opportunity.”

NEW ECONOMICS, 2020

Following the same path would be a missed opportunity and yet we may be falling into the same trap. Analysis of rescue measures implemented by countries and cities in response to Covid-19 demonstrated that only [4% of policies](#) can be classified as ‘green’, with the potential to reduce long-term GHG emissions. As we move from crisis response to recovery, there is an opportunity to take stock and choose a path of sustainable recovery which can yield economic, social and environmental returns.

For too long it has been a widely-held belief that pursuing a sustainability agenda requires greater investment for a reduced return. There is mounting evidence that implementing green, sustainable solutions has the potential to deliver savings and a high return on investment, while providing better social, environmental and public health outcomes. A [recent study](#) conducted by a team of internationally-recognized experts, including Joseph Stiglitz, reviewed 700 stimulus policies introduced in the wake of the 2009 financial crisis. The review found that the green projects that were implemented delivered higher short-term return per dollar spend and led to increased long-term cost savings when compared to traditional fiscal stimulus.

Making this choice is also fundamental to tackling this generation’s biggest challenges. The emissions fuelling climate change are also fuelling a public health crisis – air pollution. The pandemic has brought this pervasive challenge front and centre on the global stage. More than [80% of people](#) living in urban areas that monitor air pollution are exposed to air quality levels that exceed the WHO limits.

Globally, air pollution is already responsible for up to 7 million premature deaths every year and, in the wake of the Covid-19 pandemic, there is growing evidence linking exposure to air pollution to an increased risk of death from the virus. This has led to calls to keep air pollution low to help avoid a second wave of infection.

“What governments should avoid is trying to boost their economies in the wake of one global health crisis by exacerbating another – namely air pollution.”

WORLD RESOURCES INSTITUTE, 2018.

The paper sets out 3 pillars that should form a key part of cities’ sustainable economic recovery strategies: the construction of **green infrastructure**, the upgrading the **energy efficient of homes and workplaces** and the promotion of **digitalisation and changing lifestyles**. Investment in these three pillars has the potential to create jobs and spur economic growth while safeguarding public health and the environment. Governments will now also need to move to set the **foundations for their recovery programmes**. The paper lays out the financing options available to governments, including innovative mechanisms such as sustainability-linked bonds, as well as mechanisms to track the outcomes of interventions.

The scale of investment required to reinvigorate global economies, paired with growing political and public support for sustainable growth, provide a unique window of opportunity. The choices cities make now will determine the pace of economic recovery as well as the health of their citizens and the environment.

Three pillars of a post-pandemic sustainable economic recovery

While rebalancing the environment will require substantial financial investment, it also has the potential to deliver gains that far exceed the initial capital outlay, both in the short and longer term. Including **green infrastructure, energy efficient homes and workplaces** and **digitalisation** in city and government recovery packages has the potential to create jobs and spur economic growth, while safeguarding public health and the environment.

Pillar 1: Green Infrastructure

Investing in green infrastructure is widely accepted as a critical strategy to lower emissions, improve public health, and fight climate change. However, green infrastructure is also an attractive economic investment and can provide cities with the necessary **economic engine to spur growth and job creation** in the wake of the pandemic. In September 2019, the [Coalition for Urban Transitions](#) reported that implementing 16 low-carbon investments and measures in cities, including within the transport, energy, and waste sectors, could provide a collective return on investment of \$23.9 trillion – equivalent to nearly one-third of the 2018 global GDP. These measures would also cut global urban emissions by 90% by 2050.

Green infrastructure solutions straddle several sectors and include myriad investment opportunities, ranging from clean and renewable energy production and storage to ecosystem regeneration. This paper will focus on three investment options for cities: transport, urban greening and renewable energy.

“A shift to a greener economy, including investment in the energy, transport and building construction sector, could create 24 million new jobs globally by 2030.”

ILO, 2018

WHAT IS GREEN INFRASTRUCTURE?

Green infrastructure refers to clean physical infrastructure with a low carbon footprint. This can mean putting money into renewable energy assets; storage (including hydrogen); grid modernisation and carbon capture and storage technology; building efficiency retrofits; natural capital investment for ecosystem resilience and regeneration, including restoration of carbon-rich habitats and climate-friendly agriculture.

TRANSPORT

The transport sector is the world's fastest growing source of energy-related carbon emissions. In Europe, transport represents over a quarter of GHG emissions and is the main cause of air pollution in cities. Road transport is responsible for by far the largest share of emissions – over 70%. Green transport projects implemented in cities worldwide show us that there is a sustainable – and economically attractive – alternative.

PUBLIC TRANSPORT

Increased investment in **sustainable public transport can lead to significant economic growth**, both from the short-term stimulus impact of public transportation outlays and longer-term impact on economic productivity. A [study](#) from the World Bank demonstrates that a total investment of US\$4 trillion in public buses, trains and railway tracks would yield **\$1 trillion** in annual benefits by 2030, with a net present value of \$19.6 trillion – the largest of any investment modelled. **It would pay for itself in just one year.** By 2050, it could support nearly 12 million jobs.

Return on investment from investing in public transport can be broken down into three broad categories:

01 Spending Returns: Investment in public transport (purchase of vehicles, equipment and development of supporting infrastructure) and operating public transport creates jobs and stimulates growth.

02 Productivity Returns: Including vehicle ownership cost savings for public transport passengers and business productivity gains through time saved by shorter travel times and improved access to a wider pool of employees and clients.

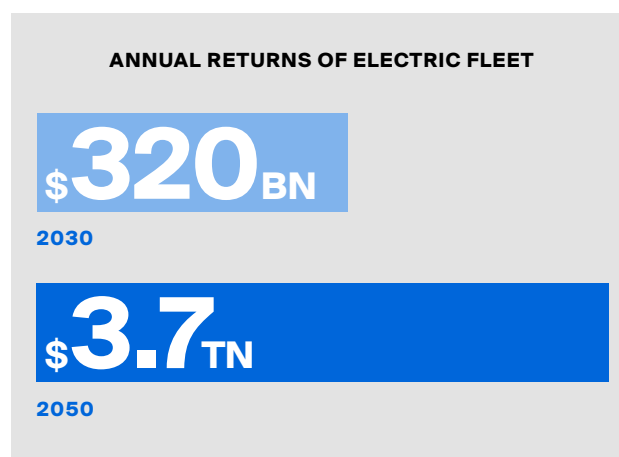
03 Public Health Returns: Savings to health care services, linked to reduced GHG emissions, and improved quality of life for citizens.

Returns can be even higher when electric and hybrid public transport solutions are implemented. While electric buses can present a higher up-front cost, there is an opportunity for high short and long term savings and returns. Evidence from Indian cities shows that electric buses earn 82% more profit than diesel buses per day,

while in the Chinese City of Shenzhen the introduction of an electric public bus has [halved the fuel bill](#).

ELECTRIC VEHICLES

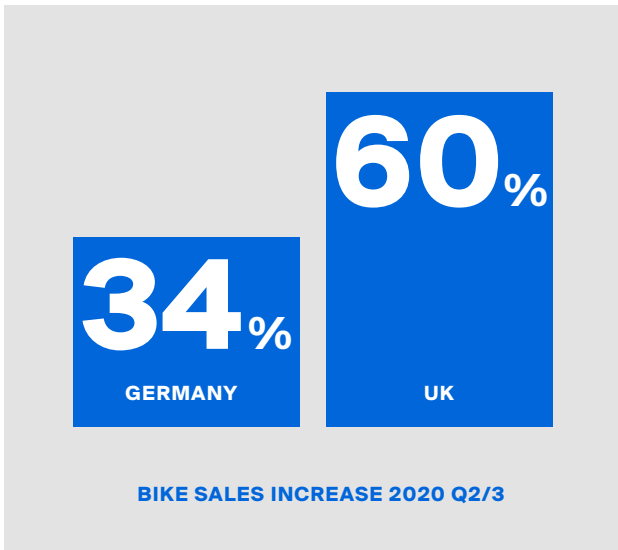
Transitioning to a more efficient electric vehicle (EV) fleet in cities would require a total incremental investment of [\\$8.6 trillion](#). This investment would pay for itself within eight years. By 2030, **annual returns would reach \$320 billion**. By 2050, that figure would exceed \$1 trillion annually, for a net present value of \$3.7 trillion. These returns largely represent the savings from avoided fuel costs: the economic benefits of lower emissions and pollution would provide even higher returns. This transition to an EV fleet would avoid releasing 0.71 gigatons of GHGs into the atmosphere by 2050 and has the potential to create **3.6 million jobs by 2030**.



In many cities, EVs represent a small but rapidly growing part of the transport sector. Cities can support this transition through a wide range of measures, including investing in financial and non-financial incentives. Oslo provides a success story which we can learn from. More than half of all new cars sold in Oslo are either fully battery electric or a plug-in hybrid. To enable this shift, national and local governments worked together to introduce a mixture of financial and non-financial incentives, including zero VAT or import tax on electric vehicles, free parking, access to bus lanes and well-developed public charging infrastructure.

CYCLING INFRASTRUCTURE

Many cities are already investing in cycling infrastructure to reduce congestion, increase the ‘walkability’ of their cities and reduce pressure on public transport. Investing in improved cycleways can also create significant **cumulative savings in public health costs** and support job creation. This agenda gained fresh momentum during the pandemic, as access to public transport was reduced in order to minimize contagion points. Due to Covid-19, bike sales have boomed across the world – up by 34 percent in Germany and 60 percent in the UK.



Berlin, Paris, Brussels and Milan are among the major European cities rolling out both permanent infrastructure and pop-up ‘corona cycleways’, in a wave of investment that includes free bicycle repairs and cycling lessons. Cities should take action now to put in place the infrastructure to support this transition to a more sustainable mobility choice.

There are multiple economic benefits to investing in cycling infrastructure:

Public Health and Economic Savings: [According to NICE](#), physical inactivity costs the NHS around £1 billion per year, and wider society £7.4 billion per year.

A [recent study](#) of 264,337 people found that **cycling to work** is linked with a 45% lower risk of developing cancer and a 46% lower risk of cardiovascular disease.

Job Creation: A [study by TLM](#) calculated that 400,000 new cycling-linked jobs could be created in the EU-27, with a doubling of cycling modal share.

Building Resilience and Business Continuity: In the face of another public health crisis, supporting more sustainable and socially-distanced mobility options will increase the resilience of citizens and businesses.

NEW PLANS TO INVEST IN CITY CYCLEWAYS AND WALKWAYS

BOGOTA Since March, the city has added 80km of new bikeways, adding to the 500km already in place.

MILAN A plan to retrofit 35km of streets over the summer for pedestrian use was announced.

PARIS Perhaps the most ambitious plan of any city, the Mayor of Paris announced plans to create an additional 50km of cycle lanes as part of the ‘Paris Respire’ Programme.

CHICAGO The City of Chicago is preparing to launch its second scooter pilot, expanding the number of scooters from 2,500 to 20,000. The pilot will cover a greater area of the city and maintain a strong focus on safety, equity and parking.

URBAN GREENING

Good quality, accessible green spaces also make cities better places to live, work and invest. During lockdown, the importance of accessible green space in cities became increasingly important as these spaces became a refuge, a place where people can relax, exercise and socialise (at a distance). These green features are a critical part of any city's green infrastructure network and can provide a high return on investment, with potential for significant economic, social and environmental gains.

Urban greening includes creating or enhancing green streets, buildings and public spaces across a city. Urban greening can have significant benefits for the environment. The positive impact of green spaces on biodiversity and air quality in cities has been [well documented](#). Depending on a city's risk profile, green space and vegetation can also be utilised as a cost-effective solution to mitigate the risk of flooding.

[In 35 cities in China, estimates indicate that the urban vegetation cumulatively stores 18.7 million tons of carbon.](#)

Ensuring access to green, walkable streets and spaces can provide several social and health benefits and associated cost savings. Access to green space has been linked to: significant physical and mental health benefits, ranging from reducing levels of blood pressure to decreasing rates of anxiety and depression; supporting [greater productivity, wellbeing and creativity](#) in the workplace; and strengthening social cohesion in communities. Evidence also suggest that the health benefits of living in greener spaces is [higher for disadvantaged communities](#) so urban greening is also an important tool to reduce urban inequality.

A [study by Public Health England](#) found that if everyone had access to green space, **£2.1 billion could be saved in health costs per year**. At the city level, the study found that in Sheffield, for every £1 spent on maintaining parks, there is a benefit of £34 in health costs saved. Yet the rate of urbanisation, growing need for housing and previous patterns of planning and construction have turned large areas of cities into concrete landscapes with limited access to green spaces. For example, in the UK, [2.6 million people](#) do not live within a 10-minute walk of green space.

[“Creating green, walkable spaces and streets can lead to significant cost-savings for Governments: in London, if every Londoner walked 20 minutes a day, the NHS could save £1.6 billion a year.”](#)

TFL LONDON WALKING ACTION PLAN, 2018.

Creating attractive green spaces in cities has been proven to draw investment, jobs and enhance the value of property. For example, the City of Trees Project in Manchester (UK) has resulted in [a 15% increase in revenue for local businesses](#), as well as providing the environmental benefits of [improving air quality and reducing surface water flood risk](#).

MICROMOBILITY: THE 15-MINUTE CITY

Throughout history, epidemics and moments of disruption have led to the design and implementation of innovations to make cities more liveable and resilient. For example, in London, the Great Fire of 1666 led to a significant shift in building materials used in cities and the cholera epidemic of 1848 resulted in the installation of a sewage system that is still in place today. Covid-19 will be no different. Many decision makers, planners and researchers are starting to process and apply lessons learned from the pandemic to see how we can increase the resilience and sustainability of our cities.

The concept of the '15-minute City' is one innovation that has gained a lot of international traction and attention in the wake of the pandemic. The idea of a 15-minute City is that all city dwellers should be able to access daily necessities such as shops, education, health-care and green space within a 15-minute walk or cycle from their home. This does not mean restricting movement, rather, as the creator of the concept Professor Carlos Moreno notes, the intention is not to "recreate a village. We want to create a better urban organisation."

The objective of implementing '15 minute cities' is to reduce the need to travel so frequently and, as a result, improve air quality and improve citizen's quality of life by helping them save time and navigate the city in a healthier way. The concept also aims to support **local economic growth**, with citizens spending more time and money in their local area and at local businesses.

The idea of increasing microbilty has been driven by the lifestyle changes resulting from worldwide lockdowns. Many people have transitioned to a new lifestyle in which they travel less, work remotely and use digital applications to gain access to services and goods we usually travel for – retail, healthcare, leisure. There has also been a boom in people getting around the city by bike and on foot. This shift has led many to see the **potential economic, social and environmental benefits of microbilty.**

As lockdowns lift, governments have the opportunity to enable and support some of the more sustainable behaviours adopted through the lockdown. Supporting the 15-minute city is one way to do so. What does this mean in practice? To support micromobility, governments can invest in creating cycle paths and walkways and also update city zoning, moving from fewer single-use buildings (commercial, retail, residential) towards more mixed-use buildings (such as residential buildings with flexible co-working spaces). Cities will also need to strengthen their digital infrastructure to enable this shift in lifestyle and urban organisation.

Many city leaders are already talking steps to implement these measures in their post-pandemic recovery plans and investment strategies. The C40, a network of international urban leaders and mayors, recently published a [Mayors' Agenda for a Green and Just Recovery](#). The Agenda recommends the creation of 15-minute cities as one of its key action items.

RENEWABLE ENERGY

Investing in renewable energy can provide economic stimulus and create jobs. Before Covid-19, many countries and cities were on a trajectory to shift investment from fossil fuels to renewable energy. As governments design their recovery packages, there is a window of opportunity to be more ambitious and scale up these investments.

During the pandemic, the fossil fuel industry was hit hard: Covid-19 caused a huge decline in demand for oil and gas in the context of stay-at home orders and economic contraction. But, in many ways, this decline represents an [exacerbation of an existing pattern](#). Since 2009, [out of the 11 sectors in the S&P 500](#), energy (dominated by fossil fuels) has performed the worse. Looking ahead, investing in renewable energy provides a **better performing investment opportunity** for governments.

Projections indicate that ambitious investment in renewable energy could reap significant economic rewards. A [study conducted by The International Renewable Energy Association \(IRENA\)](#) found that if a transformative energy pathway is taken, based largely on renewable sources of energy and steadily improved efficiency, it would effectively pay for itself, **bringing between a \$3-8 dollar return on every \$1 spent**. At a global level, taking this transformative approach would cost \$19 trillion more than the current planned energy scenario (based on planned targets and policies as of 2019) but it would bring benefits of at least \$50 trillion by 2050.

Renewable energy projects are also job intensive. Globally, already more than 11 million people work in the renewable energy sector. IRENA's study shows that if a transformative energy pathway is taken **42 million jobs in renewable energy** could be created by 2050. At a city scale, taking London as a case study, an investment of \$500m in renewable energy has the potential to generate an additional 3,700 jobs. In comparison, analysis shows that fossil fuel based investment of the same magnitude would only yield 1,987 jobs.

In London, investment in renewable energy has the potential to create nearly twice as many jobs than investment in fossil fuels.

LEVERAGING TECHNOLOGY FOR SMART GI

Digital twin technology enables the creation of an exact virtual replica of something in the physical world, constructed through data rather than physical materials. This technology has huge potential to create savings and efficiency gains in the design, construction and operation of Green Infrastructure and the built environment (See Pillar 2).

Whether for an individual building, road, power plant, or for entire city, digital twinning provides for data-driven decision making across any asset or network's lifecycle. For example, digital twins can use near real-time data collected by sensors to create predictive simulations to better understand how the asset will perform in the present and in the future. Digital twins have applications across a range of assets including transportation, energy systems, and manufacturing.

The benefits of utilising this technology to plan, build and operate sustainable infrastructure systems have won over many decision makers. In the UK, National Rail has already started to create a [digital twin of its entire railway network](#). The Government is also planning to implement a national digital twin programme to connect all aspects of its infrastructure system onto one secure network.

“The National Digital Twin Programme in the UK has the potential to unlock cost savings and efficiency gains of £7 billion a year.”

UK NATIONAL INFRASTRUCTURE COMMISSION, 2019

Pillar 2: Upgrading the Energy Efficiency of Homes and Workplaces

ENERGY-EFFICIENCY RETROFIT PROGRAMMES

The deployment of energy efficiency measures to buildings is a key pillar of any credible strategy to tackle GHG emissions. Investments in energy efficient upgrades, commonly referred to as retrofits, also have the potential to deliver long-term socio-economic returns. As such, these measures should also be a key pillar in post-pandemic recovery strategies. These energy efficiency programmes can include measures for high efficiency insulation and building fabric, high efficiency heating, cooling, hot water, lighting systems, rooftop solar panels and battery storage.

Stimulus policies targeting the buildings and construction sector often have the [greatest economic impact](#). Investments have been shown to effectively **inject money into local value chains and labour markets**, while regenerating the built environment. Building programmes focused on energy efficiency retrofitting are no exception and have the added benefits of cutting energy usage and GHG emissions, improving public health and providing **long-term economic returns for home-owners, business and governments**.

Retrofit programmes can contribute significantly to job creation. [Analysis](#) suggests that approximately 60% of expenditure on energy efficiency upgrades goes towards labour, helping to maintain existing jobs and create new ones. For example, in the United States between 2009-2011, the Government launched a stimulus package of USD 11 billion for building upgrade programmes focused on homes, businesses, government buildings and public facilities. This programme created **200,00 jobs across the country** and, for every dollar invested, 2 dollars were generated in energy cost savings.

At the city scale, taking London as a case study, [research conducted by the Association for the Conservation of Energy](#) concludes that an ambitious retrofit programme for homes in London would support over **10,300 jobs in the capital**.

For every \$1 invested in an energy retrofit programme in the United States, \$2 were generated in cost savings.

New York can also be taken as case study to demonstrate the potential cost-savings gained from energy efficiency upgrades. New York City contains just over a million buildings. Collectively, they account for 67% of the city's emissions. A pilot study focusing on the retrofitting of 23 public schools with poor energy performance will be the basis of [a new climate plan](#) for the city. The results of the study will not be released until 2021. However, projections show that the retrofits will have a combined **economic value of US\$8.6 million per year**, with a **42% reduction in greenhouse gas and carbon emissions**. Escalating this to a city-wide initiative could have a significant impact.

Increasing the energy efficiency of buildings can also deliver significant benefits to citizens' health and wellbeing. We spend 90% of our time in our homes, workspaces and other buildings. For many, during Covid-19 the proportion of time spent at home increased during periods of extended lockdown. The quality of our indoor environment can impact our physical and mental health, well-being and economic productivity. For example, cold homes have been shown to be damaging to both physical and mental health. In London, [evidence](#) suggests that for every £1 invested in renovating cold homes, the NHS saves 42 pence in reduced hospital admissions and GP visits.

Therefore, if the Greater London Authority delivered a £250 million investment in building retrofits, the NHS could benefit from savings of £105 million, not to mention the added benefit of cumulative energy cost savings, and the consequent boost to economic productivity.

If the Greater London Authority delivered a £250 million investment in building retrofits, the NHS could benefit from savings of £105 million.

REPURPOSING COMMERCIAL REAL ESTATE

WHAT IS CRE?

Commercial Real Estate (CRE) refers to any buildings or land intended to generate a profit, either from capital gain or rental income. For the purposes of this paper, the term CRE will relate to non-residential urban properties – office blocks, retail outlets, corporate and social services.

Commercial Real Estate accounts for a significant proportion of buildings in our cities. The way we use Commercial Real Estate (CRE) is changing by necessity. Over the course of the pandemic, office buildings have lain largely empty. Covid-19 has not only highlighted the risks of having large numbers of people working in close proximity but also the potential of distance and home working. [Experts predict](#) that demand for large office space will be reduced even after the pandemic is over, beckoning a shift in the commercial property market. [Investors expect a reduction](#) of at least 10% in the stock of office space in big cities.

In the longer term, this opens up the possibility of a reformed business structure where companies could move into smaller, on-demand workspaces, with a larger proportion of employees working temporarily or permanently from home.

Investors expect a reduction of at least 10% in the stock of office space in big cities.

THE ECONOMIST, 2020

A [similar trend has been identified in retail spaces](#). Even before Covid-19, the issue of redundant retail space was widely acknowledged and some investors had already started to take the opportunity to retrofit and re-purpose these spaces for other uses. Research suggests that the sector is [over-spaced by as much as 40%](#). In the light of the pandemic, the issue of redundant retail space has accelerated, as in-person retail largely came to a halt and online shopping surged. Research suggests that this [acceleration in ecommerce](#) will outlive the coronavirus.

So, what does this mean for commercial real estate? How can these buildings best be re-imagined and re-designed in a way that will contribute to economic recovery? Governments and investors are already starting to explore how some of these spaces can be re-purposed for other uses, including affordable housing, smaller flexible workspaces, and public facilities such as hospitals. Given that CRE account for a large proportion of emissions in many cities, this provides another opportunity to invest in energy efficient upgrades and retrofits. For example, in London, workplaces (265,000 buildings) account for 42% of the city's emissions and cumulatively pay £4 billion each year in gas and electricity bills.

As CRE retrofit projects are designed and implemented in the coming months and years, it would be a wasted opportunity not to upgrade their energy efficiency and lock in the benefits of healthier, greener buildings and long-term economic savings.

Pillar 3: Digitalisation and Changing Lifestyles

Digitalisation has been central to cities' and citizens' response and resilience to Covid-19. The lockdowns rolled out in over 100 countries have led to the digitalisation of many aspects of citizens' lives. Large swathes of the population are working remotely from home, students are connecting to lessons online and people are accessing more services and commerce virtually. The pandemic brought into sharp relief the magnitude of pollution generated by our everyday lives. These lifestyle changes have resulted in more sustainable behaviours, as well as a host of environmental, social and health benefits.

As lockdowns begin to lift and cities begin to re-open, governments can take action to support the continuation of some of these behavioural changes beyond the lifespan of the pandemic. This digital transformation also brings with it a raft of new economic, employment and social opportunities. In the UK, [new statistics](#) show growth in the sector is nearly six times larger than growth across the whole economy.

“The digital sector is worth more than £400 million a day to the UK economy.”

**DEPARTMENT FOR DIGITAL CULTURE,
MEDIA AND SPORT**

However, there is still significant growth that can be unlocked in the digital sector. The latest report from the [EU Digital Economy](#) and Society Index (DESI) shows that while businesses are digitalising functions and services, [only a fraction of SMEs rely on advanced cloud \(17%\)](#) and big data applications (12%). This needs to change for strong post-pandemic recovery to take place. The use of more advanced digital technologies, such as cloud computing, big data analytics, AI and the Internet of Things will enhance productivity, improve efficiency and open up new opportunities for European businesses in all sectors, all of which are crucial for economic recovery.

In order to support this rapidly growing industry, and the more sustainable behaviours adopted during lockdowns, investment will be needed to strengthen the digital foundations of cities, namely ensuring equitable access to high-speed high-capacity internet and also enhancing the digital skills of its citizens. Governments can also ride the wave of digitalisation and offer more services to citizens online to increase efficiency and save costs.

WHAT IS DIGITALISATION?

Digitalisation can be defined as the use of digital technologies to change an existing infrastructure. In a business, this can involve the implementation of new systems and tools to increase efficiency and provide the potential for new revenue. At a city – or country – level, the premise is the same but the scale is wider.

Virtual Cityscapes

REMOTE WORKING

Perhaps more than anything else, the Covid-19 pandemic has demonstrated that remote work is possible and is, in many instances, favourable. A [study by the Oxford Martin School](#) examined 483 occupations and found that 113 of them can be performed remotely – just over 23%. While this percentage is relatively low, these 113 occupations do employ 52% of the U.S population. Recently published [research from Tilburg University](#) also suggests that remote work is generally very productive, with around half of the 5,000 European respondents reporting they work longer hours while home working during the pandemic. Despite this, over 57% of respondents experienced benefits from this new way of working, with the lack of a commute increasing free time and the sense of autonomy giving them greater pleasure in their work.

Fewer daily commutes could also contribute to a reduction in GHG emissions and subsequent savings in healthcare costs, as demonstrated during worldwide lockdowns.

E-LEARNING

Remote learning was widely employed throughout the UK's lockdown period, from reception aged children up to university-level students. [Millions of users](#) also signed up to Massive Open Online Courses (MOOCs). Online learning has the potential to increase citizen's ease-of access to education and training.

As part of cities and countries recovery packages, **e-learning has further potential to support the re-skilling of the labour force.** In June, the International Labour Organization released figures showing that working hours fell 14 per cent during the second quarter of 2020 – equivalent to the loss of 400 million full-time jobs. Given the steep contraction in global working hours, e-learning provides a tangible opportunity for local and regional economic development initiatives. Gearing skills and training to include sustainable infrastructure will support long term economic benefits in terms of job creation.

IMMERSIVE RETAIL

One of the most exciting pipeline developments of recent years has been immersive media. Covid-19 has escalated the speed, scale and the necessity for AR and VR to progress. From a retail perspective, these technologies provide the opportunity to deliver a range of services to parallel – or even surpass – those available in brick and mortar stores. Examples include using virtual tours and product profiling for enhanced customer engagement, personalised shopping experiences with virtual personal shoppers and simulated beauty and clothing dressing rooms. All of these examples are possible and have the potential to transform the face of retail, while delivering **financial gains and reducing infrastructural and environmental pressures.**

“Worldwide revenues for the virtual and augmented reality (VR/AR) market will grow from US\$5.2 billion in 2016 to more than US\$162 billion in 2020. This represents a compound annual growth rate of 181.3% over the 2015-2020 forecast period.”

DELOITTE

HEALTHCARE

Prior to the Covid-19 pandemic, there was a general reluctance to embrace the potential of digital health-care appointments. During the pandemic, the need to prevent our surgeries and hospitals from becoming contagion points necessitated the adoption of telehealth and revealed its potential. Research shows that telehealth is growing rapidly. In the US, for example, [demand has increased by over 64 percent in 2020](#) and is expected to grow sevenfold by 2025.

Prior to the pandemic, the application of telehealth appointments was already starting to show its potential to improve health outcomes and save money for the National Health Service in the UK. Evidence demonstrates that use of telehealth in care homes resulted in a fall in infections, and subsequent hospitalisations, by 7.7%. This represented an estimated saving to the NHS of **£7.5 million**. We now have an opportunity to scale this impact. Based on an average of approximately [6 million](#) hospital admissions per year in the UK, if telehealth could reduce the number of admissions by even 5%, the cost saving to the NHS would be **£120 million** per year.

HOW CAN CITIES BUILD ON THIS?

Governments have an opportunity to join the move towards digitalisation and apply the lessons learned from the pandemic to the delivery of public services. Public services are ripe for a digital overhaul, with the potential to deliver efficiencies and savings for governments, businesses and citizens. Globally, [McKinsey](#) predicts that the digital transformation of governments could generate more than **US\$1trillion** annually.

In the UK, as the [Government Digital Strategy](#) explains, **digitised transactional services present a high potential return on investment**. There is a strong body of evidence to support the idea that digital delivery of public services can produce a service at least as strong as that offered through other channels at a lower unit cost. For some government services, the average cost of a digital transaction is almost 20 times lower than the cost of a telephone transaction, about [30 times](#) lower than the cost of postal transaction and about [50 times](#) lower than a face-to-face transaction.

BUILDING THE FOUNDATIONS FOR DIGITALISATION

In order to support and enable the expansion of digitalisation, governments will need to strengthen the **digital foundations of cities**, ensuring equitable access to high-speed and high-capacity internet. Without this, it will not be possible to maintain these new virtual behavioural changes or realise the potential financial and environmental gains in the digital sector.

Currently, the EU has full coverage of basic broadband infrastructure but only [44% of households](#) benefit from high capacity network connectivity. In the UK, that figure drops down to only one in five households. Access to comprehensive 5G coverage, which will provide ultra-high bandwidth and low latency connectivity to both individual users and connected objects, appears equally distant. The 5G Action Plan for Europe, adopted by the Commission in 2016, sets the objective to start

launching 5G services in all EU Member States by the end of 2020. So far, [only 17 of 27 Member States](#) have assigned any spectrum in the 5G 'pioneer bands' and only [21%](#) of the total amount of 5G spectrum has been assigned at EU level.

Governments will also need to support digital skill development to enable **equitable access to the virtual cityscape**. Prior to the Covid-19 crisis, [only 58% of EU citizens were found to have at least basic digital skills](#). Digital skills are an essential foundation to a digital society and particularly important to post-pandemic recovery. To ensure equitable access to services and enable a smooth transition to smarter, digitalised cities, governments must support up-skilling of their citizens. Governments are not alone in achieving this objective: companies and institutions worldwide, including Microsoft and the International Labour Organization, have launched courses to help people acquire the necessary digital skills needed in a Covid-19 digital society.

Globally, McKinsey predicts that the digital transformation of governments could generate more than US \$1trillion annually.

Building the Foundations for Success

Financing a Sustainable Economic Recovery

Governments and cities will now have to decide which financing sources and mechanisms to use in order to fund their recovery programmes. There are various forms of financing available for governments and cities to leverage. Public finance institutions, banks, institutional investors, corporations and capital markets all have a crucial role to play. If governments can use this financing to power a sustainable economic recovery, there is potential to deliver a return on investment that far exceeds the initial capital outlay, both in the short and long term.

Sustainability-linked bonds are an important avenue of financing that governments should consider as a means to support a sustainable economic recovery. **There has been rapid growth in the supply of sustainability-linked bonds in recent years** to fund green and social projects in urban areas, be it renewable energy, local carbon transport, neighbourhood regeneration or social housing. In 2019, over [\\$200 billion](#) worth of green bonds were issued, setting a new global milestone.

As of 2020, a new breed of sustainability bonds - coronavirus bonds - have also entered the market to finance Covid-19 response and recovery projects. To date, approximately [\\$60 billion Covid-19 bonds](#) have been issued and estimates indicate that this figure could reach [\\$100 billion](#) by the end of 2020.

Some cities and local governments are already taking advantage of sustainability-linked bonds to respond to the Covid-19 pandemic. In the UK, the West Berkshire Council issued the UK's [first local government green bond](#), raising £1 million to fund solar power projects, urban tree planting and nature conservation projects. A group of 30 local councils are planning to follow suit and aim to issue [three collective bonds](#) through the UK Municipal Bonds Agency, with a total projected value of at least £750 million.

“In 2020, Sustainable bond issuance – including green bonds, as well as social and sustainability bonds – could reach \$325bn and \$375bn.”

MOODY'S INVESTOR SERVICE, 2020

FINANCING OPTIONS

PUBLIC SECTOR FINANCING	Public sector financing includes national and state government support, including intergovernmental transfers in the form of direct grants, subsidies, low-interest loans, and/or various forms of credit enhancements. When available, governments should also exploit existing financial instruments put in place in cases of crisis, including contingency funds/ reserves and lines of credit.
PRIVATE SECTOR FINANCING	Private sector financing is generally perceived to be more expensive because it almost always involves at-risk equity capital. Also, unlike public sector financing, the risks underlying the investments are fully manifested as risk premiums in the financing costs of both the equity and debt capital.
PUBLIC-PRIVATE PARTNERSHIPS	Public private partnerships are generally long-term contracts created between governments and the private sector for the provision or construction of a public asset or service. The private party generally bears significant risk and management responsibility and remuneration is linked to performance.
SUSTAINABILITY - LINKED BONDS	National governments, and some sub-national governments, can issue green bonds and social/ sustainable bonds to fund projects that have social and/or environmental benefits. These can be leveraged to finance a broad range of projects from green infrastructure, renewable energy, green buildings, neighbourhood and public space development, and affordable housing. These bonds have to adhere to principles of Environmental Social Governance (ESG). The UN Principles for Responsible Investment (PRI) are one of the internationally recognised. ESG standards for defining the requirements of these bonds but there are myriad ESG standards and certification bodies in the market. In the wake of the pandemic, Covid-19 bonds have also entered the market to fund projects related to pandemic response and recovery.
INTERNATIONAL FINANCIAL INSTITUTIONS	Public sector development banks and development finance institutions that are owned by one or more national governments can provide lower interest loans and grants. IFIs have become important sources of large-scale investment, particularly for green and social impact investing. This year, the Council of Europe Development Bank set up a new facility – the Green Social Investment Fund – to finance projects which demonstrate a positive social impact and a contribution to climate action.
BROWNFIELD RECYCLING	Brownfield recycling involves leveraging existing public infrastructure or land assets by leasing or selling them to the private sector and using the proceeds to fund new infrastructure projects. This could provide significant revenue to fund new green infrastructure projects, free from repayment obligations.
CREDIT ENHANCEMENTS AND OTHER LEVERAGING TOOLS	Most of these tools are intended to decrease the risk and increase the liquidity on overall investments. Low-interest subordinated loans and standby contingent credits are often provided by national governments or by IFIs to help reduce risks to investors and allow cities to borrow at lower interest rates. Examples include: <ul style="list-style-type: none"> • Taxes and user charges. • Certificates of Potential Additional Construction (CEPAC) bonds, which can leverage private investment in neighbourhood upgrading through a process of rezoning and construction permit auctions. • Crowdfunding for small projects. • Local Government Funding Agencies as a multi-city pooled approach.

Environmental Social Governance (ESG) Principles

Governments will also have to decide how to select and measure the impact of different components of their recovery strategies. Environmental and Social Governance (ESG) principles and metrics provide a framework that governments can take advantage of.

ESG principles are sets of standards or criteria that investors can use to determine the potential impact of an investment on environmental, social and governance factors. These factors range from environmental pollution, human capital and labour market management, sustainability of supply chains, gender diversity and data security, among others. ESG metrics are then used to measure the impact of an investment. Institutional investor adoption of ESG principles has been [growing exponentially](#) in recent years, driven by an increase in socially-minded investors but also by [growing evidence](#) that the majority of ESG funds out-perform the wider market.

While there is not a common set of ESG principles used across the market, the [UN Principles for Responsible Investment \(PRI\)](#), aligned with the Sustainable Development Goals, are internationally recognised and are gaining traction and signatories. **Most governments have not yet taken advantage of ESG frameworks and metrics.** As countries and cities start to design and implement their pandemic recovery programmes, they should take the opportunity to apply ESG tools and principles to select, and then measure the impact of, their investments, with a view to maximise impact, enable accountability and drive data-driven decision making.

Tracking a Sustainable Economic Recovery

During the pandemic, the importance of timely, reliable, open and disaggregated data gained additional impetus, as governments moved to track the spread and impact of the virus. Maintaining a focus on quality data and data-driven decision making will be imperative to the success of cities' response and recovery programmes.

A city's data can be one of its most valuable resources. Quality urban data can be used to improve decision-making, support real-time operational control, increase service efficiency and improve engagement with citizens and businesses. **Despite the significant growth of literature, dialogue and government strategies on Smart Cities, many cities still do not have basic data infrastructure in place.** In order to effectively unlock the potential of urban data, cities need to build and strengthen their tools and capacity to collect, clean and analyse data.

As governments implement their recovery programmes, they should establish simple metrics and mechanisms to track the social, environmental and economic outcomes of their interventions over time. Doing so will enable cities to maximise the efficiency of their interventions and also help them build the business case for future green investments. Frameworks such as the SDGs and UN Principles for Responsible Investment can provide comprehensive and internationally recognized frameworks against which cities can measure their progress.

Conclusion

Covid-19 has sent shock waves across the world. The health crisis has quickly turned into a major socio-economic crisis, spurring economic recessions and significant unemployment. Many countries are also now grappling with the risk of a 'second wave' of the virus as the rate of transmission is increasing. Our cities are on the frontline of the pandemic crisis and have felt the impact more than anywhere else. However, they have also provided an insight into the potential for change and more sustainable city lifestyles.

The scale of the crisis has called for an unprecedented economic response, with governments rolling out \$10 trillion in stimulus packages in the first two months of the pandemic. Similar weight and financing will need to be thrown behind longer term pandemic recovery programmes. Broad fiscal stimulus and investment will be required to reinvigorate economies. This provides a unique opportunity for city leaders and industry to make a departure from 'business as usual' and set in place robust, sustainable and transformative recovery strategies.

One of the most significant barriers for the adoption of green and sustainable investments has been the widely-held belief that green and sustainable investments require a greater up-front cost for a reduced return. The tide is already turning against this assumption. The private sector's investments in projects that follow ESG principles has been growing exponentially in recent years, driven by growing evidence that the majority of ESG funds outperform the wider market.

"ESG factors are not just 'nice to have' but drivers of outperformance,"

JAN ERIK SAUGESTAD, CHIEF EXECUTIVE OF STOREBRAND ASSET MANAGEMENT

This paper has made the business case for governments to implement a sustainable post-pandemic economic recovery and demonstrated that implementing this approach can deliver short and long term returns on investment. It is now easier than ever for governments to choose this path, as much of the groundwork has already been laid: the growth in green infrastructure and construction projects in recent decades means that these projects are 'shovel ready' and more cost effective. If governments include green infrastructure, energy efficient buildings and digitalisation in their recovery packages, they can reinvigorate their economies and create jobs while reducing the risk – and expense – of continued environmental degradation.

Governments will now also need to move to set the foundations for their recovery programmes. This means identifying the right combination of financing instruments and designing frameworks to measure the outcome of their investments. In order to maximise impact, governments will need to create robust frameworks to track the outcomes of their investments. Despite swelling literature and dialogue on Smart Cities, many cities are still at the stage of building basic data infrastructure. Tracking outcomes against the Sustainable Development Goals provides a pragmatic and internationally recognized framework cities can use to track outcomes, enable accountability and drive data-driven decision making.

The scale of investment required, paired with growing political and public support for sustainable growth, provides cities with a unique window of opportunity. The choices cities make now will determine the pace of economic recovery, as well as the health of their citizens and the environment. The governments that proactively choose to implement a sustainable post-pandemic recovery will become the benchmark for cities of the future, reaping the gains of early investment through a stronger economy and a healthier society.

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Urban Economic

Central to our work at Urban Economic is delivering robust, evidence-based analysis, communicated effectively. Our deep understanding of the challenges faced by cities enables us to develop innovative solutions for governments, policy makers and asset owners. Rapid urbanisation is a global issue and our team's ability to work both in developed and emerging markets gives us unique perspective and insight.

Our understanding of the linkages between the economy, funding sources and development feasibility allows us to both influence and improve our urban world. Areas of work include Smart cities, transport, green infrastructure, sector growth and regional and city growth strategies and economic modelling. We have experience throughout the OECD and developing and emerging economies.

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